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JAPAN'S ECONOMIC POSITION

Frontispiece

RICE HARVEST

JAPAN'S ECONOMIC POSITION

THE PROGRESS OF INDUSTRIALIZATION

BY

JOHN E. ORCHARD

Associate Professor, Economic Geography
School of Business, Columbia University

With the collaboration of

DOROTHY JOHNSON ORCHARD

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To

J. RUSSELL SMITH

TEACHER AND ASSOCIATE, FRIEND THROUGH MANY YEARS

THIS BOOK IS DEDICATED

Prepared under the auspices of the
Council for Research in the Social
Sciences of Columbia University

FOREWORD

During the last century and a half, the Industrial Revolution has spread in ever widening circles from its point of origin in northwest Europe. It has reached the Orient and to the Oriental countries it has brought many fundamental economic changes. Machinery and power are finding their way into industry. Modern factories are supplanting the domestic workshops, and manufacturing is beginning to gain ground at the expense of agriculture as an important occupation of the people. With the increasing dependence upon industry, commerce is taking on a new significance. The Oriental countries are receiving attention as possible economic rivals of the West. It is with this transition as it is occurring in Japan and with the relation of the new economic developments to the environmental background and with some of their social and political implications that the present study is concerned.

The study is based mainly upon an investigation carried on in the Orient in 1926 and 1927 that was made possible by the interest and the generosity of the Council for Research in the Social Sciences of Columbia University and by a year's leave of absence granted by the University. Without the field work, the scope of the study would have been greatly restricted since much of the material on the background and the development of Japanese manufacturing has never been published and was obtained only through personal contact with the industries concerned. The Council has also provided the funds for the three years of research in this country that have supplemented the field work in Japan. The study is published under the auspices of the Council.

A few of the chapters have appeared in the *Geographical Review* of the American Geographical Society of New York and in the *Political Science Quarterly* of the Academy of Political Science. I am indebted to the editors of those two journals for permission to republish the material here.

For the supplementary research, I have depended upon my own collection of Japanese official documents and upon the very excellent collection in the Economics Division of the New York Public Library. It is a pleasure to express here my appreciation of the assistance and the unfailing courtesy always extended by the members of the staff of that division.

Of the hundreds of Japanese—workers, farmers, merchants, porters, industrial leaders, artisans, educators, scientists, officials of national, prefectural and municipal governments, leaders of tenant farmer and labor unions and of outcaste groups, officers of trade associations and chambers of commerce, chance passers-by—from whom assistance and information were obtained, only a few can be mentioned by name. Certainly, many of them must have considered the questions of the American regarding their occupations, their manner of living, and their antecedents unnecessarily prying, but invariably I was received courteously and with the sincere desire to be helpful. My sojourn with the Japanese people amid the beauty of their islands will long remain a pleasant memory. It is my one regret that my persistent prowlings in the factory sections and slums of the large cities and my visits to the meeting places of labor, where "dangerous thought" might be harbored, gave so much concern to the Japanese police.

My greatest debt is to Shinjiro Kitasawa, professor of economics in Waseda University, Tokyo, and prophet of the new Japan, who proved to be the open sesame to the knowledge that I sought. It was through his close contact with the industrial and agricultural workers and with the social leaders that I was able to reach a side of Japanese economic life not revealed to the investigator who entrusts himself to the guidance of the Japanese government or of the large banking houses.

Intimate contact with the raw silk industry was made possible by Saburo Morita, secretary of the Raw Silk Association of Japan, and with the tea industry by Seiichi Ishii of the Fuji Company, Ltd. Through the late Naomasa Yamasaki, professor of geography in Tokyo Imperial University, and K. Ide, professor of geology in Kyoto Imperial University, I obtained letters of introduction to the leading Japanese mining engineers and to the officials of the steel industry. Shosuke Sato, classmate of Woodrow Wilson at Johns Hopkins and now president of Hokkaido Imperial University, and K. Morimoto, professor of economics in the same institution, opened the way to an understanding of the industries and the resources of Japan's north island.

Halleck A. Butts, American Commercial Attaché in Tokyo, through advice and suggestions upon my arrival in Japan, made it possible to proceed with my investigation with the least possible delay. Miss Caroline Macdonald, of Tokyo, who has labored long as a social worker among the Japanese people and who has gained their confidence through her sincerity and her knowledge of their language, provided a contact with the important Japanese social movements.

And finally, I wish to mention Eiichi Suzuki, Shigeo Hayashi, Kenichi Matsuoka, Ichizo Harada, and Kiyomi Maeda, five young men then students of Professor Kitasawa at Waseda University, who proved to be excellent traveling companions and who, acting as interpreters and translators, aided in surmounting the formidable barrier of language and opened the way to many sources of information that must otherwise have remained inaccessible.

There are many people in the United States to whom I am indebted —representatives of Japanese concerns in New York and officials of government departments in Washington, especially the Bureau of Foreign and Domestic Commerce. Professor J. Russell Smith and Dr. Isaiah Bowman, through their friendly interest and advice, have repeatedly given encouragement when it was very much needed.

Dorothy Johnson Orchard has been associated with the study since its first inception. She shared in the arduous field work in Japan with its endless visits to factories, workshops and mines, and upon her has fallen the task of assembling and analyzing most of the statistical material. The six chapters on labor and foreign trade are entirely her work. Her active experience with the American labor movement from 1923 to 1926 provided a sound background for the analysis of the Japanese labor supply.

JOHN E. ORCHARD.

COLUMBIA UNIVERSITY,
September, 1930.

CONTENTS

PAGE
FOREWORD ix

CHAPTER I

SOME PROBLEMS OF THE NEW JAPAN 1

CHAPTER II

THE PRESSURE OF POPULATION 4

The Increasing Population—The Historical Background of the Population Growth—The Static Population of the Tokugawa Period—Famines of the Tokugawa Period—Poor Administration of the Country—Low Birth Rate of Tokugawa Period—The Hampering Restrictions of Feudalism—Rapid Growth of Population with Opening of Japan—No Decline in Death Rate—Increase in the Birth Rate—Increase in Food Supply—More Efficient Use of Land through Agricultural Specialization—Increase in Production through Breaking Down of Feudalism—New Occupations of Modern Period.

CHAPTER III

THE SEARCH FOR A SOLUTION 26

Expansion and Intensification of Agriculture—The Reclamation of Land—Improvements in Farming Methods—The Mechanization of Agriculture—Possibilities of a Change in Diet—Population Relief through Emigration—Migrations to Hokkaido—Karafuto—Korea—Formosa—Manchuria—Emigration to Foreign Countries—Emigration to Brazil—Birth Control—Industrialization.

CHAPTER IV

THE INDUSTRIAL BACKGROUND. 49

The Principal Manufacturing Industries—The Use of Wood—Industrial Processes—The Small Establishments—The Location of the Principal Industries—The Art Industries—The Pottery Industry—The Iron and Steel Industry—The Copper Industry—The Making of Textiles—The Kyoto Industrial Center—The Unimportance of Foreign Trade—A Comparison of Japan and Eighteenth Century England.

CHAPTER V

THE BEGINNING OF INDUSTRIALIZATION: COMMUNICATIONS. 73

The Triumph of the Machine—The Japanese Defense—The Need of Developing Trade and Manufacturing—Government Initiative in Westernization—Scarcity of Capital—The Inadequate Industrial Background—Building of Railways—The Nationalization of the Railways—The Telegraph—The Telephone—Shipbuilding—The New Shipyards—The Merchant Marine.

CHAPTER VI

THE BEGINNING OF INDUSTRIALIZATION: MANUFACTURING. 89

Government Assistance—Foreign Experts—The Industrialization of Cotton Spinning—The Weaving of Cloth—The Reeling of Raw Silk—The Export of Silkworm

PAGE

Eggs—The Tomioka Filature—The Mining Industry—The Iron and Steel Industry—The Imperial Steel Works—The Preparation of Tea—The Rubber Industry—The Match Industry—The Brewing Industry—The Making of Paper—The Chemical Industry.

CHAPTER VII

PRINCIPAL MANUFACTURING INDUSTRIES 111
Measures of the Relative Importance of Industries—The Leading Manufacturing Industries—The Textile Industries—The Reeling of Silk—Cotton Spinning—Cotton Weaving—The Other Major Industries.

CHAPTER VIII

THE INDUSTRIAL DISTRICTS: THE RAW SILK AREA 120
The Concentration of Silk Reeling—Factors Locating the Raw Silk Industry—The Rearing of Cocoons—Topography and Soil—Climate—Labor—The Suwa District.

CHAPTER IX

THE OSAKA-KOBE-KYOTO INDUSTRIAL CENTER 132
The Importance of Transportation—The Osaka Area—The Development of Osaka—Advantages for Manufacturing—The Principal Manufacturing Industries—The Textile Industries—The Fabrication of Iron and Steel—The Kobe Area—The Advantages and Disadvantages for Manufacturing—The Principal Manufacturing Industries—The Kyoto Area—The Principal Industries.

CHAPTER X

THE OTHER INDUSTRIAL CENTERS 155
The Tokyo-Yokohama Center—The Principal Manufacturing Industries—The Metal Industries—The Textile Industries—The Nagoya Center—Transportation Facilities—The Textile Industries—The Pottery Industry—Minor Centers of the Nagoya Area—The Northern Kyushu Industrial Center—Advantages for Manufacturing—The Principal Manufacturing Industries—The Imperial Steel Works—Other Industries of the Kyushu Center—The Minor Manufacturing Regions of Japan—Shizuoka—East and West Coasts of Honshiu—Hokkaido.

CHAPTER XI

THE MEASURE OF INDUSTRIALIZATION 182
The Importance of Agriculture—The Increase in Number of Factory Workers—The Small Size of the Industrial Establishments—The Prevalence of the Contract System—The Making of Lanterns and Umbrellas—The Geta Industry—Pottery, Brushes, Cutlery and Silk Cloth—The Organization of the Cloth Industry.

CHAPTER XII

THE PROGRESS OF FACTORY DEVELOPMENT 209
The Importance of Silk Reeling in Industrial Progress—The Minor Importance of the Silk Weaving Industry—The Growth of Cotton Spinning—The Position of Cotton Weaving—The Weakness of the Iron and Steel Industry—Consumption of Power—The Poor Reputation of Japanese Goods—The Activities of the Trade Associations—Foreign Trade as a Measure of Industrialization.

CHAPTER XIII

THE EFFECTS OF THE WORLD WAR ON INDUSTRIALIZATION 231
The Expansion of Industry—The Postwar Depression—The Textile Industries—The Iron and Steel Industry—A Summary of Japanese Industrial Development.

PAGE

CHAPTER XIV

CAPITAL AND MECHANICAL SKILL 242
The Scarcity of Capital—The High Interest Rate—The Effects of the Scarcity of Capital on Industry—The Use of Old Equipment—The Absence of a Mechanical Background—The Dependence on Foreign Machinery—Japanese Industrial Inventions—The Organization of Japanese Factories—The Inefficiency of the Silk Industry.

CHAPTER XV

RAW MATERIALS AND WATER POWER 260
Raw Materials for the Textile Industries—Raw Cotton—Wool and Minor Fibres—Timber Resources—Water Power—Mineral Resources—Copper—Other Non-ferrous Metals—Sulphur—Clay and Sand—Chemical Materials.

CHAPTER XVI

THE IRON ORE AND FUEL RESOURCES OF THE JAPANESE EMPIRE 276
Iron Ore Resources—Iron Sands—Coal Resources—The Distribution of the Deposits—The Scarcity of Coking Coal—Petroleum Resources—Korea as a Source of Iron Ore and Coal.

CHAPTER XVII

MANCHURIA AS A SOURCE OF RAW MATERIALS 292
Japanese Expansion in Manchuria—Manchuria as a Source of Food—The Iron Ore Resources—The Penhsihu Iron Works—The Anshan Iron Works—The Fushun Colliery—The Marketing of Anshan Pig Iron—Other Iron Ore and Coal Resources—Other Raw Material Industries—Summary.

CHAPTER XVIII

CHINA AS A SOURCE OF IRON ORE AND FUEL 312
Coal Resources—Iron Ore Resources—The Hanyehp'ing Iron and Coal Company—The Hanyang Iron Works—The P'inghsiang Colliery—The Tayeh Iron Mine—The Tayeh Blast Furnaces—Summary of Japanese Relations with Hanyehp'ing Company—Other Iron Ore Deposits of China—The Penetration of Japanese Capital into China—Japan's Search for Iron Ore in Other Lands—The Malay Peninsula—Australasia—India—Philippine Islands—Summary.

CHAPTER XIX

THE LABOR SUPPLY 339
The Scarcity of Factory Labor—The Recruiting of Labor—Labor Piracy—Labor Turnover—Unemployment—The Cheapness of Labor—The Level of Wages—Wages in Relation to the Cost of Living—Labor Costs—Disadvantages of the Dormitory System—Discharge Allowance—Paternalism in Japanese Industry.

CHAPTER XX

THE EFFICIENCY OF LABOR 362
The Effect of Low Wages—The Effect of Long Hours—Night Work for Women and Children—The Relative Efficiency of the Japanese Worker—Efficiency in Cotton Spinning—Efficiency in Cotton Weaving—Efficiency in Other Industries—Possible Increases in Efficiency through Shorter Hours—Increases in Efficiency through Improved Machinery.

PAGE

CHAPTER XXI

THE DEVELOPMENT OF A LABOR MOVEMENT. 382
The Pressure of International Standards—The Background of the Labor Movement—The Yuai Kai—The Present Labor Movement—Obstacles to the Labor Movement—The Household Industries—The Influence of Paternalism—Government Suppression of the Labor Movement—Internal Dissension in the Labor Movement—The Political Labor Movement.

CHAPTER XXII

THE CHANGING STATUS OF LABOR 403
The Factory Acts of 1911 and 1923—Other Social Legislation—Present Aims of Labor—The Upward Trend of Wages—The Contributions of Labor to Rationalized Industry.

CHAPTER XXIII

THE DEPENDENCE OF INDUSTRIALIZATION UPON FOREIGN TRADE. 419
The Unfavorable Balance of Trade—Dominant Position of Raw Materials in the Import Trade—The Importance of Semi-manufactures in the Export Trade—The Threats to the Raw Silk Exports—The Increasing Importance of Cotton Goods Exports—Cotton Trade with China—Obstacles to Japanese Cotton Trade with India—Possible Markets for Expansion of Japanese Cotton Trade—Other Export Industries.

CHAPTER XXIV

ANALYSIS OF MARKETS FOR JAPANESE EXPORTS 448
The American Market—The Asia Market—The Anti-Japanese Boycotts in China—The Tatsu Maru Episode—The Boycott of 1909—The Boycott against the Twenty-one Demands—The Shantung Issue and the 1919 Boycott—Political and Economic Effects of the 1919 Boycott—The 1921 Boycott—The Boycott of 1923—The Tsingtao Incident of 1927—The Tsinan Incident in 1928—The Cost of the Boycotts to the Chinese—Summary of Effectiveness of the Boycotts—China's Tariff Autonomy—Trade with the Rest of Asia—British Indian Trade—Other Possible Markets for Japanese Exports.

CHAPTER XXV

THE OUTLOOK FOR THE FUTURE 481
The Yellow Industrial Peril—An Oriental Industrial Revolution—A New Policy toward China.

LIST OF PRINCIPAL SOURCES. 490

INDEX 493

JAPAN'S ECONOMIC POSITION

CHAPTER I

SOME PROBLEMS OF THE NEW JAPAN

NO more than two generations ago Japan was an isolated and almost mythical land, known to Europe and the West only through the writings of a few Dutch scientists and the tales of chance mariners who had dared to enter Japanese ports. Commodore Perry in 1853 found a country still in the feudal age ruled by a warrior class carrying on its petty conflicts with sword and bow. Manufacturing was of little importance and in industry there was practically no use of iron and steel or of mechanical power. Methods of land transport were more primitive than those employed in Europe a century earlier. There was no navy, and merchant vessels were limited to small junks suitable only for navigating protected bays and inland seas. Foreign trade was the monopoly of Chinese and Dutch merchants and was restricted to a few commodities.

Japan is today a world power and the outstanding nation of Asia. Her armies have met and defeated China and Russia and she played an important rôle in the World War. At the Paris Peace Conference, she was accorded a position among the five major Allied Powers. Sword and bow have given way to modern armaments and to battleships and cruisers and submarines. In the London Naval Armament Conference of 1930, Japan's naval needs were recognized to be second only to those of the United States and Great Britain.

Railways now thread the islands formerly served by sedan chair and pack-horse. The small, wooden junks have been replaced by steamships and the merchant marine of Japan is surpassed only by the fleets of Great Britain and the United States. There has been a great change in manufacturing, and Japanese goods compete in world markets with the manufactures of the industrial nations of the West.

The transition from the old Japan to the new has been rapid. It has been accomplished only through the persistent endeavors of an energetic people and the active encouragement and assistance of a centralized and paternalistic government, one of the few heritages of the feudal age that has contributed to the building of modern Japan. The transition has been so rapid and so marked that it has been easy to exaggerate it, and at times there has been the tendency in Europe and America to picture Japan as a possible military and industrial menace.

The emergence of Japan to world importance has occurred in the face of many difficulties. It has brought in its train a number of perplexing problems. It has made necessary a large army and a large navy, and the expense of their maintenance has placed a heavy tax burden upon the Japanese people. The breaking down of isolation, external and internal, has encouraged the growth of the population and the density is increasing at an alarming rate. To support the population, more food must be provided either through the expansion of agriculture or through importations. There does not seem to be much prospect of any further expansion or intensification of agriculture, and if food is to be obtained from other countries, commodities must be available to export in payment.

Japan has had the ambition to become the England of Asia. In the early part of the eighteenth century, England faced somewhat the same situation that has confronted Japan since the opening of the country. England was agricultural, the standard of living was low, and the outlook for supporting larger numbers was so discouraging that the writings of the economists of the period were characterized by their pessimistic and dismal tone. But England became a manufacturing nation. Population increased much more rapidly than could ever have been anticipated, and there was a substantial advance in the standard of living. Agriculture has declined in importance, and at the present time not more than 8 or 10 per cent of the population is dependent upon the land. The products of English agriculture would support the people for a very few weeks if foreign supplies should happen to be cut off.

Japan is attempting the same solution of her population problem and is bending every effort to the encouragement of industrialization. But more than the intervening span of 200 years separates the England of the eighteenth century and the Japan of today. Manufacturing in the eighteenth century was limited to primitive household industries producing largely for local markets. England, with her factory system and her mechanical power, was the first to enter a wider field. Her goods, manufactured cheaply, quickly gained control of the markets of the world. The domestic workshops could not survive in competition with the English textiles and iron and steel and machinery. It was upon this virtual monopoly and upon the assurance that the world stood ready to absorb the seemingly endless stream of manufactured goods from English factories and to send to her in exchange food and raw materials that modern England was built.

The monopoly continued through many decades but it has now been broken. Other countries have adopted the factory system and have developed manufacturing industries to supply first their own demands and then a surplus to sell abroad. England has been meeting stronger and stronger competition. Her position was rapidly becoming less secure prior to 1913, but the World War greatly accelerated the industrialization of her former customers. Today, England has an industrial establishment with a possible output far beyond the demands of foreign markets. A curtailment of production has been necessary, and there is serious unemployment, especially in the textile and iron and steel industries—the producers of the export staples. For the time being, at least, England may be said to be overpopulated and as yet no solution for the present dilemma has been found.

Into such a commercial world, already widely industrialized, Japan seeks to enter. There are few countries that are not attempting to supply their requirements for manufactured goods, and in the parts of the world where industrialization has made no progress, Japan will meet the competition of a dozen manufacturing countries intent upon disposing of the surplus products of their factories.

It is doubtful whether any nation in the future can safely place so great a dependence upon manufacturing and trade as England has done. It seems certain that no nation can ever hope to hold again the same dominant position in the manufacturing and trade of the world, or even of a continent.

There is a second and a very vital contrast between England and Japan. England possessed as a basis of industrial expansion abundant supplies of raw materials for manufacturing, notably iron ore and coal. They were easily accessible and were well situated with reference to each other and the sea. Japan has few raw materials and certainly, if she must depend upon her own natural resources, there can be no industrial development at all comparable to that of England.

In the following chapters is presented a study of the economic transition through which Japan has passed since the middle of the nineteenth century. It is approached with a recognition of the progress in industrialization that has already occurred and an appreciation of the difficulties that have been encountered. It is a critical analysis of the economic position of modern Japan and provides the background for an estimate of the possibilities for further development.

CHAPTER II

THE PRESSURE OF POPULATION

THE pressure of a rapidly increasing population is the most fundamental problem of modern Japan. It underlies most of the country's perplexing difficulties. It explains the efforts that are being made to improve agriculture and reclaim waste land, to develop manufacturing, and to expand trade. It is the basis of Japan's foreign policy. It has become an important issue in internal politics, effective in the making and unmaking of cabinets. It has caught the attention of the public, and in the press and periodicals it is being discussed by economists and publicists more widely, probably, than any other subject. To understand the present-day economic conditions of Japan, the full significance of the population problem must be appreciated.

THE INCREASING POPULATION

The increase in population is not a new phenomenon, for since the beginning of the modern era there has been a remarkable growth, but in the earlier years there seemed to be no cause for concern. In fact, the increase was regarded with approval as an evidence of natural strength. In the years immediately following the World War, there was even a widespread belief in Japan that the rate of population growth had been retarded, and such opinions were frequently expressed at the Washington Disarmament Conference in 1921. It would seem, however, that they were based on the vital statistics of the years 1918 and 1919, unusual because of the ravages of the influenza epidemic. The more recent returns have shown a very different story.

The first national census was taken in 1920, and the second in 1925. For the intercensal years and for the years prior to 1920, the population estimates are based upon the number of births and deaths and are not directly comparable with the census returns. Between 1920 and 1925, the population increased from 55,963,000 to 59,737,000, an average of 754,800 per year.[1] The present keen interest in the population problem may be said to have begun with the announcement of the Bureau of Statistics of the Imperial Cabinet that the net increase for the year 1925 had been 963,000. The increase for 1926 was 962,000[2] and the statistics of births and deaths for the more recent years indicate that the population of Japan is increasing by more than 900,000 per year[1] or at a rate and in absolute numbers surpassed among the leading nations only by the phenomenal growth of the United States and perhaps Russia, both countries with vastly greater areas than Japan, and the United States augmenting its natural increase by a large annual influx of immigrants.

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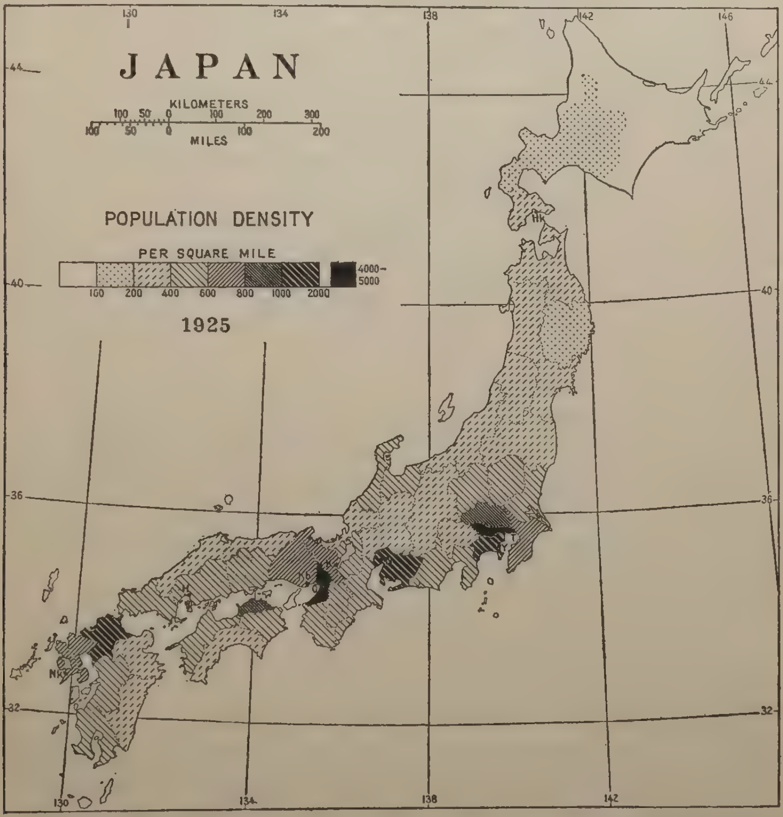
[1] Japan, Bureau of Statistics of the Imperial Cabinet, Census of Japan Proper, 1925.

[2] Japan, Bureau of Statistics of Imperial Cabinet, Résumé Statistique de L'Empire du Japon, 1928.


JAPAN
KILOMETERS
100 50 0 100 200 300
100 50 0 100 200
MILES
POPULATION DENSITY
PER SQUARE MILE
100 200 400 600 800 1000 2000
4000–5000
1925
130
134
138
142
146
44
40
36
32
Hk
T
Y
N
K
O
Kb
H
Nk

(*John E. Orchard*)

FIG. 1.—Population density of Japan by prefectures, 1925. The largest cities are indicated by initial letters: *O*, Osaka; *T*, Tokyo; *N*, Nagoya; *K*, Kyoto; *Kb*, Kobe; *Y*, Yokohama; *H*, Hiroshima; *Nk*, Nagasaki; *Hk*, Hakodate.[2]

The full magnitude of the population increase can perhaps be expressed best in terms of the demand upon the food supply. An increase of 900,000 people a year obviously necessitates a corresponding increase in the food supply if there is to be a maintenance of the existing standard of living. Rice is the staple food of Japan and for many years the per capita consumption has been approximately 5½ bushels.[1] For the additional 900,000 in the population, an annual increase of 5,000,000 bushels in the rice production will be necessary. To grow that much rice about 133,000 acres[2] of land must be added to the existing rice land. Such an area may seem small to Americans only one generation removed from the days of free land in the Middle West, but for the past 20 years the annual increase in rice land in Japan has been only from 25,000 to 35,000 acres per year.[3] To meet this new pressure on food supply, Japan must annually bring under cultivation an area of new land four to five times greater than the area she has been able to make arable in any past year by the expenditure of the most arduous labor. Japan has no frontier of empty lands available for the taking. If production is to be increased, cultivation must climb higher up the mountain sides, steeper slopes must be terraced, farm land must be pushed farther into the sea, swamps reclaimed, new irrigation systems built, or greater crops forced from the soil—always in the face of greater and greater obstacles.

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[1] *Trans-Pacific*, Tokyo, Aug. 1, 1929.

[2] Data from Census of Japan Proper, *op. cit.*, 1925.

If the land cannot be made to maintain the increasing numbers, some new means of support must be found. They must turn to commerce or manufacturing, or they must seek a livelihood abroad. If these outlets prove impossible, Japan must either check the population growth or be faced with a heavier and heavier pressure on the means of subsistence and a resulting decline in the standard of living.

THE HISTORICAL BACKGROUND OF THE POPULATION GROWTH

The growth of population in Japan is apparently one of the results of the opening of the country to western influence. At least, it had its beginning with that event. Though the population statistics for the years previous to 1920 cannot be accepted without reservation, they do serve as a fairly accurate basis of comparison. Since 1860, the population has doubled. For perhaps two centuries prior to that date, it remained practically stationary (see Figure 2). It is not easy to understand why the ending of Japanese seclusion should so directly affect the population growth. The usual and seemingly obvious explanation of the increase must be dismissed. The introduction of western hygiene and medical science has brought no decline in the death rate. There

[1] Japan, Department of Agriculture and Forestry, Agricultural Conditions of Japan, 1925 (in Japanese), p. 79.

[2] The average output per acre for the five years, 1924 to 1928, was 37.4 bushels, Japan, Statistical Abstract of the Ministry of Agriculture and Forestry, 1928.

[3] *Op. cit.*

has been no appreciable change in the rate since 1873 with the exception of a marked rise in epidemic years such as 1918.[1]

The increase of the Japanese population is the effect of more complicated causes to be understood only after an examination of the main events of the years preceding the opening of the modern period.[2]

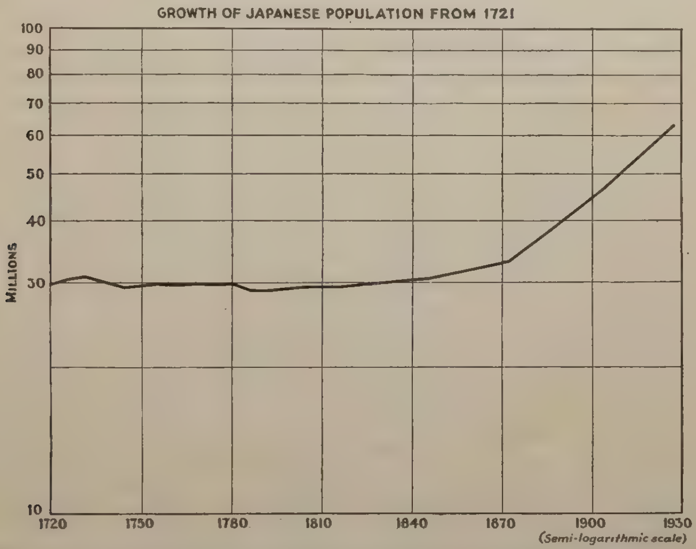

FIG. 2.—The static condition of the population of Japan during the Tokugawa period was in striking contrast to the rapid increase of modern times.[3]

THE STATIC POPULATION OF THE TOKUGAWA PERIOD

When Commodore Perry led his four vessels into Uraga Bay in 1853, he unwittingly hastened the close of a great period in Japanese history, the period of the supremacy of the Tokugawa shoguns, a supremacy that had its beginning in the opening years of the seventeenth century. The shoguns were powerful nobles who, in theory, governed as the representatives of the emperor but who were the real rulers of the country. From the twelfth century Japan had been torn by internal wars, contests between rival claimants for the throne or between the Imperial family and the shogun for the ruling power. The country was divided among great feudal barons or daimyos and they were continually at war with one another. The battles were bloody[4] and the marching armies destroyed and ravaged the crops. Under such conditions the population could not increase.

---

[1] Résumé Statistique, *op. cit.*, 1928.

[2] The historical discussion that follows is based in part on A History of Japan, by James Murdoch in three volumes: Vol. 1, 1910; Vol. 2, 1903; Vol. 3, 1926. For a more detailed account, the reader is referred to that work, especially to Vol. 3.

[3] Data from Garrett Droppers, "The Population of Japan in the Tokugawa Period," *Trans. of Asiatic Society of Japan*, Vol. 22, 1894, pp. 253–284; Résumé Statistique, *op. cit.*, 1926–1928

[4] In one battle in 1600, upward of 30,000 men were killed.

In the first decade of the seventeenth century, the supremacy of the shogun was established by the Tokugawa family. The feudal lords were subdued and the civil wars came to an end. Very shortly, the country entered upon its period of seclusion. Foreigners were expelled, and contact with the rest of the world was limited to a very closely supervised trade with the Dutch and the Chinese. The Japanese were not allowed to leave the islands. With the removal of the likely causes of either internal or external disputes, there began an era of peace that was to continue without a break for two centuries and a half. No other nation has ever enjoyed so prolonged a freedom from both domestic and foreign warfare. It might seem to be a period favoring a great growth of population, but certainly for the last century and a half of the Tokugawa rule, the only years for which statistics are available, and probably for the entire period, the population was stationary.[1]

The first general census was taken in 1721, and it was decreed that beginning with 1726 there should be a census every six years. The data are admittedly incomplete. The returns for a number of the census periods have been lost, and for other years it is not certain whether outcastes were included. Two daimyos did not include children under fifteen, and in no case were the samurai, or warrior class, and their servants returned. The same errors and omissions, however, probably persisted for the entire period, and the statistics do serve as an index of the population growth. In 1721, the registered population, without any correction for probable omissions, was a little over 26,000,000. A century and a quarter later, in 1846, it was 26,900,000. During the period from 1721, the population had dropped below 25,000,000 in 1792 and had never reached 27,000,000.[2] The high and low points for the 125 years were separated by only 2,000,000—a marked contrast to the present annual increase of approximately 900,000.

Famines of the Tokugawa Period

The stationary population is to be attributed to a number of causes. The Tokugawa era was a period of famines, and famines are a more severe check on population than wars. Wars kill off the strong, but famines weaken the survivors and mark the succeeding generations. In the 150 years between 1690 and 1840, there were 22 famines in Japan, of which 11 were very destructive of life. One of the most serious famines occurred as late as 1837. The famines of China and India do not exceed in their horrors some of the famines of

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[1] DROPPERS, *op. cit.*

[2] *Op. cit.*

Japan in this era. In some districts, the population was reduced to such straits that the bodies of those who perished from starvation were not safe, and the death of the weaker ones was sometimes hastened.

The famines were caused by flood and drought, by frosts and typhoons, by volcanic eruptions, and by insect pests, but their severity and the great suffering and loss of life were due to the organization of the country and to maladministration by the rulers. The Tokugawas had created a political empire, but the country was still economically a number of distinct states. Land transportation was little developed and was limited to pack-horses or to man-drawn vehicles over poor roads. Effective use was not made of the seacoasts and waterways, for, in order to keep the Japanese within the country, sea-going boats had been destroyed and the building of boats above 50-ton capacity, later increased to 100 tons, had been prohibited. The rivers of Japan are short and turbulent, and are not well adapted to commerce except in their lower courses. Goods, if permitted by the daimyos to cross their boundaries, were subject to heavy dues. Trade between different parts of the Empire was difficult, especially a trade in bulky food products.

With the exception of the great cities which drained the rest of the Empire for their support, each district had to be practically self-sufficient. In the event of famine, there was little possibility of assistance from more fortunate districts. The nation as a whole was in much the same situation. Japan's trade with the outside world was restricted to a few commodities of small bulk and high value. Rice could not be brought in from China or southeastern Asia to relieve a shortage. Japan was an isolated country made up of isolated units, and the country or the unit prospered or starved, depending upon the local yield of the land.

Because of the division of the country into isolated units and the absence of communication between them, there could be no regional specialization in production. Japanese agriculture was subsistence agriculture, and the land could not be made to produce to its full capacity. Whatever the topography or the climate or the soil, food was necessarily the first consideration. Though natural conditions might be much more suitable for tea or mulberry, neither of those crops provided subsistence in time of shortage, and there was no market for a surplus. Their production was not important even though the shogunate had exempted from taxation lands so planted. During the opening years of the Tokugawa period, the shogun encouraged the production of raw silk, but the frequent recurrence of famines diverted the land from the mulberry to food crops and the silk industry fell into a great depression.[1] So essential was the cultivation of rice that the production of raw silk was not even sufficient to meet the demand within the country and silk was imported. During the period of isolation, silk, mostly from Bengal, Tongking, and China, was the most important single commodity brought in by the Chinese and the Dutch traders. In some years, as much as 60 to 70 per cent of the value of their imports was represented by silk.

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[1] Japan, Sericultural Association, The Sericultural Industry in Japan, compiled for the Japan-British Exhibition, 1910.

The caste system that flourished under the Tokugawas, though borrowed from China at a much earlier period, reflected vividly the local nature of production. The all important personage in the economy of the people was the farmer, for from him came food and all wealth. To him was assigned a position high in the social scale immediately beneath the warrior class—the daimyos and samurai. The farmer and the samurai had originally been one, but with the growth of the feudal system had come specialization, and the samurai became distinct as a warrior class that no longer tilled the land. The merchant received scant recognition. Trade was insignificant, and the merchant seemed to contribute little. In times of famine, he might even become the oppressor of the people, for he sometimes held back rice in order to secure higher prices. His was the lowest class beneath the artisans and above only the outcastes.

Poor Administration of the Country

The economic disorganization of the country alone was not responsible for the severity of the famines. Even if transport had been easily available, there would have been no reserves in most of this period to send to the stricken areas. Some of the shoguns made provision for the storage of rice in the plentiful years against the coming of calamity, and Yoshimune, the eighth shogun, was able to save many lives during the famine of 1732 by sending rice from his granaries along the Sumida River in Tokyo to Kyushu and Shikoku. But later shoguns gave little attention to the welfare of their people. The stores of rice were dissipated by corruption or drawn upon to pay feudal dues and very shortly the stocks built up by Yoshimune were depleted and never replenished. Japan, during most of the Tokugawa period, suffered from poor government centered in the corrupt and extravagant court of the shogun.

Other agencies besides famine contributed to a high death rate. Fires, earthquakes, volcanic eruptions, and other calamities of nature took a large toll of life both directly, and indirectly through the famines that usually followed them; but they were probably no more frequent or serious than in earlier or later periods. Disease was not an important factor, for Japan does not appear to have suffered great plagues, probably because of her island position and her isolation policy. According to Dr. Baelz, a noted authority, the common diseases of old Japan were smallpox, measles, dysentery, and perhaps typhus. Cholera, the plague of China and India, was almost unknown.[1] The frequent resort to capital punishment can scarcely be called a major check on population, but it did contribute to the death rate, for it has been stated that the executions during one year throughout the whole Empire now would scarcely equal the deaths from capital punishment in one day in Tokyo under the Tokugawas. In the exalted chivalry of the period, seppuku, or suicide by a highly conventionalized method, was common and in general life was cheap before the sword of the samurai.

Low Birth Rate of Tokugawa Period

Not only was the death rate very high during the Tokugawa period, but the birth rate was kept low by a number of checks. Although there was extravagance and profligacy at the courts of the shogun and the emperor, the upper classes, or samurai, seem to have lived for the most part frugal stoical lives. Their income, fixed in rice, fluctuated in value with fluctuations in price. They engaged in no productive occupation and could not add to their incomes. They lived as parasites on the labor of the farmers, giving in return no measure of service, for in a land of peace their swords were no longer needed. Their profession was a closed one, since they were an obsolete heritage of the previous period of war, and new samurai were rarely created. By law, the number of family heads was limited, and the first son inherited his father's position as well as his income and property. A second son, if not adopted as heir into the childless family of another samurai, had the choice of becoming a dependent upon his elder brother or of forsaking his class and becoming a farmer, an artisan, or a merchant. There was a great deal of legislation on succession, the net outcome of which was to establish the principle of primogeniture so rigidly that in all classes only the eldest son, the inheritor of the family property, could marry with any assurance of economic security.

Among the samurai, to have more than three children was degrading. They rarely married before the age of thirty, but earlier marriages were usual among the common people. Abortion and infanticide were practiced in all levels of society. Certain physicians and midwives were noted for their skill in procuring abortions though the practice was forbidden by law. The Japanese word for infanticide is "mabiki," which is the same word used to describe the thinning of a field of vegetables. In Kyushu, it was the custom to kill two out of five babies and in other districts, as far as the records show, the babies born were practically all boys.[2] Similar to the practice of infanticides was the practice of doing away with the aged. Near the city of Nagano, there stands in the midst of the magnificent rice terraces a large rock where, according to local tradition, the old women of the valley were exposed to die after they had passed beyond their years of usefulness.

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[1] Droppers, *op. cit.*

[2] E. Honjo, "The Agrarian Problem in the Tokugawa Regime," *Kyoto University Economic Review*, Vol. 1, pp. 75–93, 1926.

The Hampering Restrictions of Feudalism

These positive checks on the population were due for the most part to the scarcity of the food supply. In a land visited so frequently by famine, a large family was not to be desired. A new member of the family meant not a new producer, but an additional consumer of a food supply already insufficient. Japan was dependent almost entirely upon agriculture, and the mountainous character of the islands did not favor the cultivation of the land. The arable area during the Tokugawa era certainly did not exceed 13 per cent of the whole and for much of the period it was probably nearer to 8 per cent.[1] There is little justification, however, for the contention often advanced that this agricultural nation had reached in this period a point of population saturation. The productive capacity of the land was less hampered by the limitations of nature than it was by the restricting regulations of the feudal system.

All classes were surrounded and bound down by the most exacting rules. Their daily lives were governed to the minutest details. The number of families was fixed, whether to check population growth or to prevent the recurrence of family feuds over the right of succession it is not certain. The effect of that limitation has already been noted. The rigid caste system arranged the population in water-tight compartments, and the sons had little choice but to follow in the footsteps of their father; and in professions where there was no expansion there was always overcrowding. To prevent the growth of a class of large landed proprietors, a possible source of danger to the shoguns, it was decreed that the peasants could not sell their lands.[2] Though the law probably had the desired effect, it also kept good land in the hands of indifferent cultivators. It even resulted in the abandonment of land by some owners who dared to ignore the laws and seek other occupations. The peasant could not change the character of the use of his land. He could not reclaim new land without first receiving the permission of the head of his village. He could not leave his village or enter another village without permission. Taxes were very heavy and there was little stimulus to a greater production since a larger output usually led to heavier exactions by the tax gatherer.[1]

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 353. Also KAN-ICHI ASAKAWA, "Notes on Village Government in Japan after 1600," *Journal American Oriental Society*, Vol. 31, 1911, pp. 151–216, reference on p. 159.

[2] "Japanese Feudal Laws (a translation of 'Edict in 100 Articles,' of text given in Kodai-Hoten)," *Transactions Asiatic Society of Japan*, Vol. 41, Part V, 1913. Also ASAKAWA, *op. cit.* Some Japanese authorities seem to believe that the purpose of this regulation was to protect the peasants from the loss of their lands. Whatever its purpose, the effect on production would be much the same.

Numerous regulations made farming difficult. One shogun, because he was born in the Year of the Dog, decreed that no dog should be killed. The authority of the shogun was so absolute that the decree was enforced and even was extended to other animals. For the death of a dog the offender paid with his life. The farmer did not dare to throw stones at the birds feeding in his grain fields for fear that he might injure them. At the death of this shogun, the decrees were rescinded, but they had been in force long enough to discourage many farmers and to take much good land out of cultivation.

Not only was the development of agriculture hampered, but the feudal laws and the restrictions on internal and external trade discouraged the growth of manufacturing. Manufacturing was still in the handicraft, household stage, but if transportation had been possible, it could have been developed to yield a considerable product to exchange with other districts and other countries for food. As it was, industry was restricted to the supplying of the needs of the immediate locality, and even that limited market was greatly reduced by the many sumptuary laws. They forbade the wearing of silk except by the highest classes. They limited the number of coats that a man might possess. They regulated the size and construction of the dwellings, the number of presents that might be given at weddings and births, and the richness of the feasts.[2] Manufacturing was as much on a subsistence level as was agriculture. The country was unable to make use of a large part of its productive capacity. It was due to the economic organization of the country and to the hampering effect of the feudal system that Japan had made so little progress in manufacturing when her period of isolation finally was ended.

Such was the Japan of the end of the Tokugawa era—a country static in population, stagnant in agriculture and in industry. Contrary to the beliefs of most economists, the arrested growth was not due to the exhaustion of the agricultural possibilities. The point of population saturation had not been reached, but the country had expanded and developed to the utmost limits of the inelastic economic and political system of the feudal age. Further expansion was possible only with the bursting and the casting off of that constricting shell. The opening of Japan to the world accomplished just that. It brought in the transportation methods of the West and made the country an economic unit, but more important, it broke down the caste system and destroyed feudalism with all the restrictions that had so hampered agricultural and industrial progress.

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[1] D. B. SIMMONS and J. H. WIGMORE, "Notes on Land Tenure and Local Institutions in Old Japan," *Transactions Asiatic Society of Japan*, Vol. 19, 1891, pp. 37–270. Also ASAKAWA, *op. cit.*

[2] SIMMONS and WIGMORE, *op. cit.* Also ASAKAWA, *op. cit.*

RAPID GROWTH OF POPULATION WITH OPENING OF JAPAN

With the opening of the country came many changes, none more striking and more significant than the rapid increase in the population. For perhaps two and a half centuries, the population had shown no growth and had experienced many periods of starvation. Almost immediately upon the defeat of the shogun and the restoration of the emperor to power, the increase in the population began. The first estimate of the population since the restoration of the emperor was made in 1872. It was an estimate more accurate and more complete than the census that had been taken every six years under the shoguns, and to be comparable, the returns of the Tokugawa period must be corrected by adding approximately 3,000,000 to allow for the classes not counted. In 1872, the population was 33,000,000, or an increase over 1850 of perhaps 3,000,000. The more rapid increase began in 1875. In the next five years, though it was the period of the Satsuma Rebellion, there was an increase of 2,000,000 or at the rate of 12.43 per thousand per year. By 1889, the total was 40,000,000 and 20 years later the 50,000,000 mark was passed. Since 1910, with the exception of the two years 1918 and 1919, the rate of increase has been from 12 to 15 per thousand per year, and the present absolute annual increase is approximately 900,000.[1]

No Decline in Death Rate

Predictions are sometimes made of the great increase in population that will take place in Oriental countries when they come under the influence of the Occident. They are based on the expected lowering of the death rate with the introduction of improved sanitation and medical knowledge. It is held that with a population dying at an Occidental rate, but still being born at an Oriental rate, a great increase in numbers is inevitable.

Japan's great population increase is not due to any lowering of the death rate through the introduction of Occidental sanitation and science. Famine has disappeared as a cause of death, but the present death rate is apparently no lower than the death rate of non-famine years of the Tokugawa era. In 1873, the death rate was 19.6 per thousand and in 1928 it was 19.8. In the intervening period of 55 years, it ranged most of the time between 19 and 22 per thousand with a low point of 16.6 per thousand in 1880 and a high point of 26.8 in 1918.[2]

[1] Résumé Statistique, *op. cit.*, 1928.

[2] *Op. cit.*, and announcement of the Home Office, Statistical Bureau, published in *Japan Financial and Economic Monthly*, June, 1929.

Japan has never been subject to great plagues though, since the coming of the foreigner, cholera has occurred in some of the ports and the high death rate of 1918 was due to the influenza epidemic. There have always been present a great many intestinal diseases, due probably to the diet and to the use of human excreta as manure for the rice fields. Neither the diet nor the method of fertilizing the land has changed with westernization. If anything, the chances of intestinal diseases have been increased, for with a greater population there are greater chances of contamination. At present, the diseases of the stomach and the intestines are the most common causes of death. In 1927, about 18 per cent of the deaths were due to diseases of the digestive organs.[1]

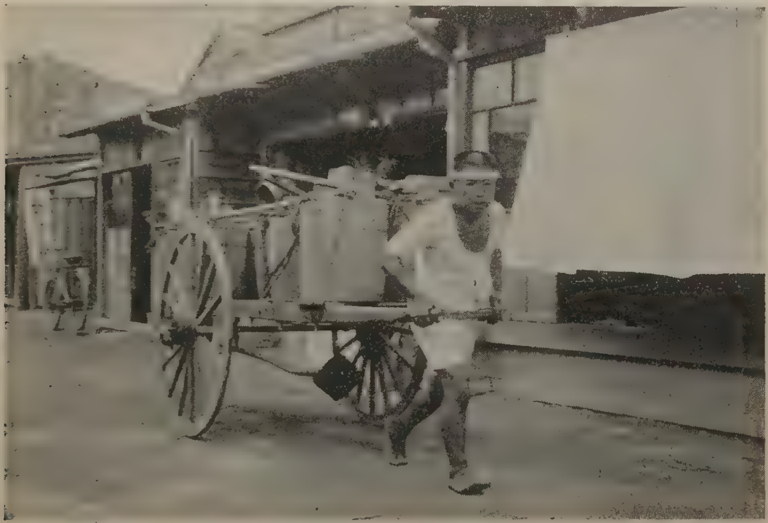

FIG. 3.—The sewage system of Japan is above ground. Night soil is collected in tubs in the cities, even in Tokyo, and used as fertilizer on the neighboring rice fields.

The growth of industry and the urbanization of the population have caused in some countries an increase in the death rate. Most of the Japanese cities have developed since 1875, and now some 37 per cent of the population live in communities of over 10,000. In 1890, only 13.4 per cent were urban.[2] The larger cities, however, generally have a death rate lower than the average for the whole country or for the rural areas. In 1925, for example, the death rate for Japan was 20.3 per thousand. For Tokyo, it was 16.6, and for Osaka, now the largest city of the country, it was 19 per thousand. The purely agricultural prefectures of Toyama and Ishikawa had death rates around 25 per thousand.[1] In Tokyo City, the death rate was below the general average for the country in 24 of the 30 years from 1897 to 1926.[2]

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[1] Résumé Statistique, *op. cit.*, 1929.

[2] Japan in the Beginning of the Twentieth Century, Imperial Japanese Commission to the Louisiana Purchase Exposition, 1904. Résumé Statistique, *op. cit.*, 1913–1929.

Increase in the Birth Rate

The cause for the growth of population in Japan since the beginning of the modern period is to be found in a birth rate that now exceeds the birth rate of any of the other great nations with the possible exception of Russia. In 1872, the birth rate was 17 per thousand; in 1928, it was more than double that rate, or 34.4. The vital statistics of Japan present some rather marked contrasts with the statistics of the leading western nations (see Figure 4). In Japan alone has the curve of the birth rate shown a general rising tendency. In the United States, the United Kingdom, and Germany during the past 50 years, it has steadily declined. Japan, in 1927, had almost exactly the same birth rate as the United Kingdom and Germany in 1870, and the 1927 birth rate of the United Kingdom was the same as the 1870 birth rate of Japan. Despite their declining birth rate, however, the population of the three western nations has increased because their death rate has declined. Japan has accomplished her phenomenal increase in population, not by the conservation of life, but through an amazing fertility. The high birth rate has in fact contributed to the death rate, for in the four years from 1924 to 1927 almost 38 per cent of the deaths occurred among children under four years of age.

COMPARISON OF THE BIRTH RATES AND DEATH RATES OF JAPAN AND CERTAIN OCCIDENTAL COUNTRIES

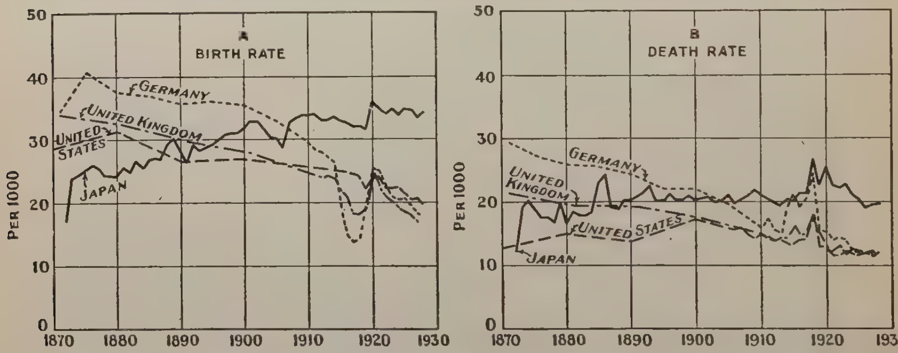

FIG. 4.—Both the birth rate and the death rate of Japan are increasing in contrast with the declining rates of most western countries.[3]

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[1] *Kampo*, September 1, 1926 (*Official Bulletin* of Japanese Government, in Japanese).

[2] Tokyo Municipal Office, Bureau of Statistics, Annual Statistics of the City of Tokyo, 1928.

[3] Data from U. S. Census, Vital Statistics, 1900; U. S. Department of Commerce, Mortality Statistics, 1924, 1928; U. S. Statistical Abstract, 1929; Résumé Statistique, *op. cit.*; Statistical Abstract of the United Kingdom, 1928; Germany, Statistische Jahrbuch für das Deutsche Reich, 1928. United Kingdom from 1922 on excludes Irish Free State.

The stimulation of the birth rate in a country that had had for over two centuries a birth rate only barely able to balance the annual deaths was the result of a number of influences. There was a change in the attitude of the nation toward the size of the family. In the previous period, there had been laws against abortions and infanticides, but they were not enforced and, in view of the state of public opinion, they probably could not have been enforced. With the opening to the West, the Japanese leaders decided that a large population—man power—was essential for defense and for aggression if that should ever become necessary. There began an active propaganda to establish the idea that a large family was the patriotic duty of every loyal subject of the emperor and that an increasing population was a sign of national strength. Only recently, a Japanese statesman in a public address said that the population must continue its increase until it had reached 100,000,000, and a prominent industrialist declared in a press interview that the rapid increase of population was a sign of the good health and strong vitality of a nation.[1]

So successful was the propaganda and so firmly has the idea of an increasing population been fixed in the Japanese mind that to one not familiar with the nation's history before 1850 it might seem to be an integral part of the Japanese religion, a heritage of former centuries. The large family has become a sacred institution and to all excepting the most liberal minded, any attack upon it is almost as profane as an attack upon the emperor himself.

Increase in Food Supply

This philosophy of the large family, no matter how vigorously disseminated, could probably have never obtained so firm a hold on popular thinking if there had not been made available at the same time more abundant means of feeding the greater numbers. Rapidly as the population has grown, the increase of the food supply has more than kept pace with it. During the modern period, there has been no recurrence of famine, and the standard of living has advanced materially.

Data for the measure of changes in consumption are very limited and not entirely reliable. It is difficult to reduce them to simple and comparable factors isolated from qualifying variables. For the purposes of this study, however, the per capita consumption of seven essential staples, rice, wheat, barley, naked barley, meat, fish, and sugar has been estimated for the present and for the earliest years for which data are available. The results are presented in Table I.

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[1] *Trans-Pacific, op. cit.*, p. 20, July 18, 1929.

TABLE I.—ESTIMATES OF CHANGES IN THE JAPANESE STANDARD OF LIVING, YEARLY CONSUMPTION PER CAPITA[1]

Commodity	Years	Average annual per capita consumption, pounds		Index	
		Past	Present	Past	Present
Rice	1887 to 1891	296	.....	100	118
	1921 to 1925	.....	349	...	
Wheat[2]	1892 to 1896	31	......	100	152
	1923 to 1927	.....	48	...	
Barley	1892 to 1896	57	......	100	73
	1923 to 1927	.....	42	...	
Naked barley	1892 to 1896	49	......	100	72
	1923 to 1927	.....	35	...	
Meat[3]	1889 to 1893	0.9	......	100	466
	1922 to 1926	.....	3.99	...	
Fish	1900	29	......	100	282
	1924 to 1926	.....	82	...	
Sugar	1896 to 1898	10.4	....	100	125
	1922 to 1926	.....	12.99	...	

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[1] Estimated from Japan, Department of Agriculture and Commerce, and Department of Agriculture and Forestry, Statistical Reports.

[2] The per capita consumption of wheat consumed as flour in the United States is estimated at 250 pounds for 1925, U. S. Commerce Yearbook.

[3] The estimates of meat consumption are based on the number of animals slaughtered and do not include poultry.

For the five years, 1921 to 1925, the per capita consumption of rice was about 18 per cent greater than the consumption for the years 1887 to 1891. It is a small but significant increase since rice is the basis of the Japanese diet. It occupies a position comparable to that of wheat in the western diet, and the demand is relatively inelastic. Any increase in the per capita consumption may indicate the substitution of rice for some less desirable cereal, and that is apparently what has happened, for in approximately the same period the consumption of barley and naked barley declined by 26 and 29 per cent, respectively. In Japan, as in other countries, they are the poor man's substitute for the favored cereal. At the same time, the consumption of wheat increased by 52 per cent. Wheat flour is largely imported and is considered a luxury food. These facts are all evidence of an advancing standard of living in Japan, for despite the very marked drop in the consumption of barley and naked barley, the total per capita consumption of the four major cereals has increased by about 11 per cent in 35 years.

Though meat is an important index of the standard of living in the West, it cannot be given the same weight in Japan. For centuries before the opening of the country, there were laws, both political and religious, forbidding the killing of animals and the eating of meat. There was some consumption of meat despite these restrictions, but it is only since the country has had contact with the West that meat has been regarded as particularly desirable in the diet. It is a very insignificant item even now, being consumed mostly by the wealthier classes and by those who have come into contact with foreign ways. Since 1889, the per capita consumption of meat has increased from about 1 to 4 pounds per year. Though it represents a fourfold increase, the present amount is insignificant in comparison with the annual consumption of 145 pounds per capita in the United States for the five-year period, 1922 to 1926.

The consumption of fish is a much better measure of the Japanese standard of living, for in the Japanese diet, it is next in importance to rice and is consumed in some form by all classes of society. It is estimated that since 1900 there has been an increase of 182 per cent in the consumption of fish in Japan. The present consumption is about three and a half times the annual per capita consumption in the United States.

Sugar, also considered an index of a high living standard in western countries, does not enter in important quantities into the Japanese diet, the present consumption being less than one-eighth the annual per capita consumption in the United States.[1] Since 1896, however, there has been an increase of about 25 per cent in the Japanese per capita consumption.

Though the above evidence is by no means conclusive, it does show that the great increase in population in Japan during the past half century has been accomplished without the sacrifice of the standard of living of the people. The opening of Japan to the West had as one of its results a tremendous increase in the food producing capacity of the country. It was an increase all the more remarkable because it was due, for the most part, not to the introduction of any startlingly new inventions or agricultural devices, but to a reorganization of existing methods. With a resumption of trade with the outside world, it was possible to import food, especially rice, in case of a national shortage, but Japan has had to place little dependence on the importation of food. At present, not more than 10 per cent of the food consumed within the country is imported and with little effort the country could become completely self-supporting.[2]

The West contributed more rapid means of transportation and the task to which the new government first addressed itself most vigorously

[1] Estimates of the per capita consumption in the United States are based on data in the U. S. Commerce Yearbook.

[2] E. C. GREY, "The Food Problem in Japan," *Trans-Pacific, op. cit.*, July 30, Aug. 6 and 13, 1927, investigating food problems in Japan for the League of Nations.

was the building of railroads and roads to connect all parts of the country. In the Meiji era, the era of the first emperor of the modern period, the unification was completed and the country became an economic empire. The tariff barriers of the old feudal lords were abolished and trade within the country moved freely.

More Efficient Use of Land through Agricultural Specialization

Trade, both internal and external, developed markets for surplus products and agricultural specialization became possible. Rice continued to be the major crop and to occupy the choice land, but crops that could be produced only with difficulty gave way to crops more suited to local conditions. Under the Tokugawas, cotton was grown widely, especially in the southern and eastern parts. A foreign writer referred to cotton in 1876 as one of the most important plants in Japanese agriculture and was of the opinion that its cultivation would continue to increase and that Japan would become an exporter of the raw fiber.[1] At the present time, very little is grown, though I have talked with old men in Tochigi Prefecture north of Tokyo and in Hamamatsu, in Shizuoka Prefecture, who remember that much cotton was formerly grown in those localities. Since 1899, the earliest year for which figures are available, there has been a tremendous shift and decline in the localities producing cotton. Osaka, which then led all the other prefectures with a production of 7,690,000 pounds, now produces less than 1,500 pounds and Ibaraki, the leading prefecture, produces only 12,000 pounds.[2] The cotton can now be brought in from India or from America and the land can be used for the production of food (see Figure 5). In Chiba Prefecture, to the east of Tokyo, much land was formerly in soy beans, but now the land is in rice and the beans are imported from Manchuria for the soy breweries established under the Tokugawas.

In Nagano, a prefecture of narrow valleys and steep mountain slopes in the central highland mass, much new land has been brought into cultivation in the last 50 years. During the feudal period, all of the flat bottom land and the lower slopes had been put into rice, but the upper slopes were unproductive because they could not be made to grow rice, and there was no way of disposing of the surplus of any of the crops that they might have grown. They were used to some extent for the production of mulberry for the silk industry, but since transportation was poor and there was no market for the surplus silk, only enough was produced for local consumption and perhaps for the payment of taxes. One of the early railroads penetrated the valleys of Nagano and a means was provided for carrying the raw silk to the seacoast where already contact with the western world had created an insistent market. The area in mulberry increased rapidly and Nagano, a prefecture with little level land, is now one of the more prosperous prefectures. In 1925, the area in mulberry was almost three times as

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[1] T. B. Poate, "On Cotton in Japan," *Transactions Asiatic Society of Japan*, Vol. 4, p. 145, June 14, 1876.

[2] Japan, Department of Agriculture and Commerce, Statistical Report (In Japanese), 1901; Department of Agriculture and Forestry, Statistics of Agriculture and Forestry (in Japanese), 1925.

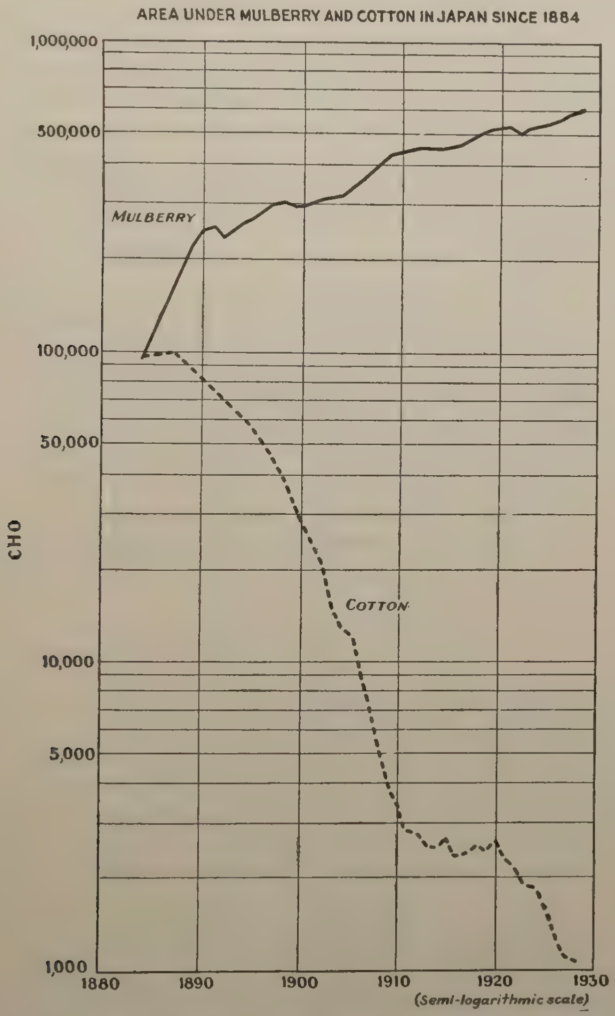

FIG. 5.—Specialization has crowded out the cultivation of cotton and increased the area under mulberry in Japan. (One cho equals 2.45 acres.)[1]

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[1] Data from Japan, Department of Agriculture and Commerce, Statistical Report, *op. cit.*, 1895–1915; Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1924–1928.

great as the area so used in 1891, and the output of raw silk had increased more than tenfold.[1]

In Shizuoka, another mountainous prefecture, the production of tea has increased threefold since 1890. In all of Japan between 1905 and 1928, the increase in land under dry cultivation (largely mulberry, tea and other specialized crops) was 15.6 per cent and the increase under wet cultivation (rice) was only 10.8 per cent.[2]

With the improvement in transportation within the country, local famines became an impossibility. Droughts, floods, typhoons, and earthquakes still do occur but it is always possible to bring supplies into the stricken areas.

Transportation aids in the prevention of famines in a still more positive way. In the summer of 1926, along the northeast coast of the main island, especially in Shibata County of Miyagi Prefecture, there was no rain over a period of several weeks. It was just at the time of the rice transplanting, but transplanting was impossible in fields that were drying up and cracking. The rains finally came, but the transplanting period had been so shortened that the farmers did not have the labor to complete the work before the plants became too large. Farmers in other villages for some distance around learned of their difficulties and rushed to their assistance traveling on a local electric line. The journey would have been practically impossible with the transportation facilities of the feudal period.[3]

Increase in Production through Breaking Down of Feudalism

Another influence that cannot be emphasized too strongly in its encouragement of increased production was the breaking down of the feudal system and all of its shackling restrictions. The sale of farm land was no longer prohibited, and very shortly the good agricultural fields came into the possession of the good cultivators and the poor cultivators gravitated to the poor land. There were no longer restrictions on the use of the land, and it could be put into any crop that the cultivator and owner considered profitable. The reclamation of new land was encouraged. The peasants were permitted to move about the country at will. The removal of all these restrictions, without any increase in the area under cultivation, would have resulted undoubtedly in a substantial increase in the food production.

During the Meiji era, the production of rice has increased at almost exactly the same rate as the population (see Figure 6). Statistics for the earlier years are not available, but in 1880 the output of rice for the population of 36,000,000 was 159,000,000 bushels[1] or 4.46 bushels per capita. The population had increased to about 64,000,000 in 1928 and the rice yield to 299,000,000 bushels[2] or 4.67 bushels per capita. The increase in output has been due in part to the reclamation of new lands and to the increase of the area of arable land planted in rice, but most of it must be attributed to the intensification of agriculture and to consequent higher yields of the land under cultivation. The per capita area in rice has actually shown a decrease from 0.172 acres in 1880 to 0.122 acres in 1928. For the five years from 1880 to 1884, the average yield per acre was 24.16 bushels, and for a similar period ending with 1928, the average was 37.7 bushels.[4]

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[1] Japan, Department of Agriculture and Commerce, Statistical Report (in Japanese), 1894; Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1925.

[2] Agricultural Conditions of Japan, 1925 (in Japanese), *op. cit.;* Statistical Abstract of Ministry of Agriculture and Forestry, *op. cit.*, 1928.

[3] *Japan Advertiser*, Tokyo, July 24, 1926.

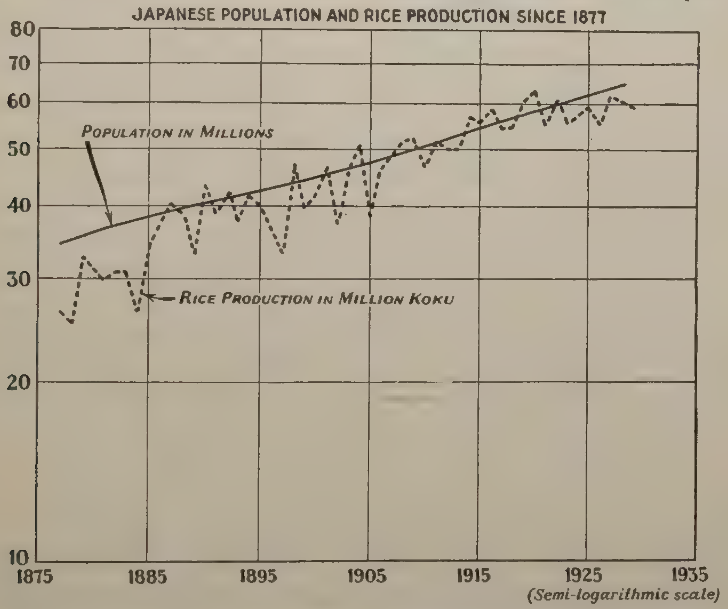

FIG. 6.—The population of Japan and the total production of rice have increased at almost the same rate in the last fifty years. (One koku equals 4.96 bushels.)[3]

It should be remembered that this great increase in production has been accomplished in a country that for over two centuries was on the very margin of subsistence with famine following famine. It cannot be explained by the importation of any revolutionary agricultural methods from the West, for rice is still cultivated by hand with the same tools and fertilized in very much the same manner that it has been for centuries. It cannot be explained by any improvement in the environment. Soil, area, topography, and climate all remain as they were The only significant change has been the securing to the people of a greater degree of economic and social freedom. To the economic unification of the country and to the removal of all the cramping restrictions of feudalism, more than to any other influences, Japan owes the more abundant food supply of the present day. The released population has been able to establish new relationships to its physical surroundings much more productive than the old could ever have been.

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[1] Résumé Statistique, *op. cit.*, 1887.

[2] Statistical Abstract of Ministry of Agriculture and Forestry, *op. cit.*, 1928.

[3] Data from Department of Finance, Financial and Economic Annual of Japan, 1902; Statistical Report of Department of Agriculture and Commerce, *op. cit.*, 1901, 1905, 1917; Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928; Japan in the Beginning of the Twentieth Century, *op. cit.*; Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1924, 1925; Résumé Statistique, *op. cit.*, 1926, 1928; *Japan Financial and Economic Monthly*, June, 1929; *Trans-Pacific*, *op. cit.*, Feb. 6, 1930.

[4] Statistical Abstract of Ministry of Agriculture and Forestry, *op. cit.*, 1928; also Résumé Statistique, *op. cit.*, 1887.

The destruction of feudalism deprived the samurai of their incomes and they were forced into other activities. Early in the Meiji era, it was estimated that the warrior class numbered over a million and a half.[1] They were now added to the productive capacity of the country. Some became farmers, but more were absorbed in the new occupations introduced with the opening of the country, occupations that also provided an outlet for the surplus farm population. The caste system was broken down and a huge reservoir of productive ability was thus released to find employment wherever opportunity offered.

New Occupations of Modern Period

The development of internal and external transportation and communications created a new demand for labor both for construction and for operation. In 1920, 9 per cent of those gainfully employed in Osaka were engaged in transport,[2] an occupation of little importance as long as the country was made up of isolated units. With transport has come trade both external and internal, and the merchants have become something more than engrossers of rice during famine periods. It is now evident that they bring wealth to a locality because they provide a market for the goods that may be produced beyond the local consuming capacity. A new social system has grown up and the merchants are no longer a despised group. The great trading families are among the most powerful and influential in Japan.

The creation of markets and the repeal of the old sumptuary laws have encouraged the development of manufacturing industries, but here, as in the case of agriculture, the more significant expansion has come, not through the introduction of western inventions and methods, but in the stimulation of the household industries that have been in

[1] Résumé Statistique, *op. cit.*, 1887.

[2] Osaka Municipal Office, Statistical Abstract for Osaka, p. 10, 1924.

existence for centuries. Freed of restrictions they have developed rapidly and have provided goods both for domestic consumption and for export to other lands. They have offered an outlet for employment to a population increasing beyond the labor demands of the land. With the development of trade and manufacturing, there has been a developing of banking and insurance and of all the other necessary parts of a business society.

It is in these city occupations that the bulk of the population increase has been absorbed, for it is in the urban centers that the increase has been most marked. Between 1890 and 1925, the number of people in towns and cities of over 10,000 increased from 5,504,000 to 21,853,000, an increase of almost 300 per cent. During the same period, the rural population increased from 35,465,000 to 37,884,000, or by less than 7 per cent.[1] The remarkable growth of the cities has been due for the most part to migrations from the rural areas. The rural birth rate has been higher consistently than that in the cities. In 1925, of the 102 communities designated as cities, the birth rate was higher than the general average for the country in only 11, most of them located either in Hokkaido, the north island, or in the distinctly agricultural sections of Honshiu. The average birth rate for the entire group of cities was 29.27 per one thousand in comparison with 34.9 for all of Japan.[2] In the cities that have experienced the most phenomenal increase, the birth rate has been relatively low, Osaka having a rate of 26.68 in 1925, Kobe 27.14, and Tokyo 28.8. The great increase in the production of food has been accomplished through a better use of the land and there has been no corresponding increase in the demand for labor in the rural areas. The surplus labor has been forced to seek employment in the new occupations, largely urban, that have come in with the modern period.

Such are the influences that have produced the Japan of today, a country with a population increasing so rapidly that her leaders are viewing the future with concern. They know that the land cannot support the increasing numbers and they fear that the migration to the cities cannot continue indefinitely.

[1] Japan in the Beginning of the Twentieth Century, *op. cit.;* Résumé Statistique, *op. cit.*, 1923–1929.

[2] *Kampo, op. cit.*, Sept. 1, 1926.

CHAPTER III

THE SEARCH FOR A SOLUTION

OUT of the present concern and the interest in the population increase has come the suggestion of a number of possible solutions of the problem. Few of them are new. Most of them are means of relief that have been in operation in some degree for many years. A consideration of the more important will serve to emphasize the seriousness of the Japanese situation.

EXPANSION AND INTENSIFICATION OF AGRICULTURE

Since Japan is and always has been an agricultural nation, it was quite natural that relief should first be sought through an improvement in agriculture, but the physical structure of the country has restricted the use of the land and at present only 15.4 per cent of the total area is arable,[1] a more limited area than in any other great nation (see Figure 7). Surrounding the mountainous centers of the islands are narrow coastal lowlands widening out in places to fairly extensive plains or penetrating the highlands along the bottoms of narrow steep-sided valleys. In the small percentage of the surface considered arable are included not only the plains but the lower slopes of many hills and mountains that have been terraced into rice fields by the expenditure of much human toil. Some of the terraces, notably those near Nagano City, are more than 1,000 years old and for all of that time they have been in rice. In the island of Kyushu, the outer crater of the volcano of Asosan has been reclaimed, and now in the crater bottom there are some 20 villages. Rice fields cover the floor and mount in steps far up the crater rim. In the center, rises a cloud of sulphurous smoke from the new crater, an ominous warning of the fate that may await those whom the pressure of numbers has forced so near. There is in Japan little more hill land that can be made ready for rice no matter how great the expenditure of labor. The plains have long since been claimed by man, with the exception of the belts of barren gravel land so common along the lower courses of Japanese streams. A part of those lands may perhaps be reclaimed, but only by large scale operations conducted by the government or by a corporation and the area thus brought under cultivation will add relatively little to the area already in use.

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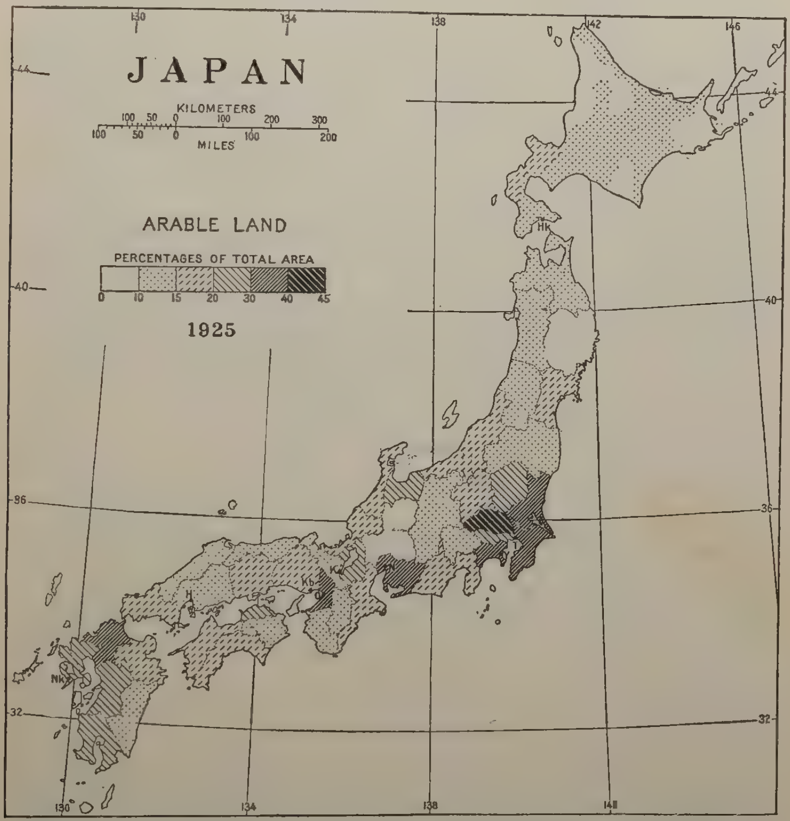
[1] Announcement of Ministry of Agriculture and Forestry, as of September, 1929.

Because of the limitation of the arable land and the large population dependent upon agriculture, the Japanese farm is small. The average holding of the 5,600,000 farm households is only 2.7 acres, and 91 per cent of the farmers have less than 5 acres of land. So small are many of the farms that 29 per cent of the farmers must depend in part upon subsidiary occupations.[1]


JAPAN
KILOMETERS
100 50 0 100 200 300
100 50 0 100 200
MILES
ARABLE LAND
PERCENTAGES OF TOTAL AREA
0 10 15 20 30 40 45
1925
130
134
138
142
146
44
40
36
32
HK
K
Kb
NK

(*John E. Orchard*)

FIG. 7.—Percentage of arable land in relation to total area by prefectures, 1925.[2]

The Reclamation of Land

Though it is a matter of vital importance, no careful survey and classification of the land area of Japan has been made in recent years. It is estimated, however, that there still remain in the country about 5,000,000 acres[3] that may be reclaimed, an area about one-third of the present arable area, but sufficient to add less than one acre on the aver-

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[1] Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928.

[2] Data from Japan, Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1926.

[3] Japan Year Book, Tokyo, p. 443, 1926.

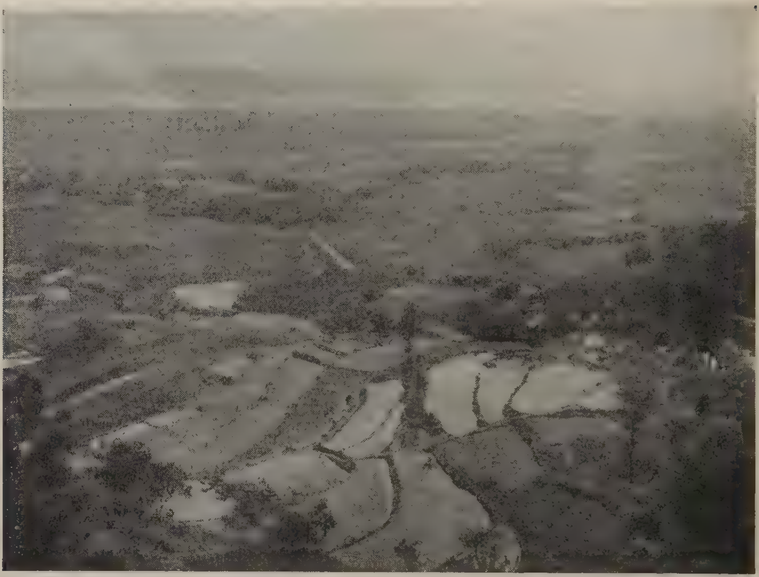

FIG. 8.—The pressure of population has made necessary the terracing of steep slopes for the cultivation of rice.

FIG. 9.—There are twenty farm villages in the old crater of Asosan. Rice terraces cover the floor and lower slopes.

age to each farm. About one-half of it is considered to be suitable for conversion into rice paddies. The total estimate seems large even though it does include the boundary ridges and pathways that are to be saved by the consolidation of small fields and the redivision of farms. If it is accepted, however, with the rather improbable assumption that the land will be as productive as the land now under cultivation, there seems to be the expectation of increasing the food supply by some 33 per cent, or sufficient for a population increase of 20,000,000.

That this expectation is unduly optimistic seems evident from an examination of the history of land reclamation in Japan. In the 23 years between 1905 and 1928, the arable land was increased by about 1,723,000 acres, or an average annual addition to the land under cultivation of less than 75,000 acres. At such a rate, it will require 65 years to reclaim the estimated possible area, but the 20,000,000 population increase will be reached in less than 25 years. It is not likely that even this slow rate of reclamation can be maintained, for the later projects will probably be more difficult. Already, a decreasing rate of reclamation is evident. In the ten-year period from 1918 to 1928, the average acreage reclaimed annually was only 15,000 acres, or one-fifth of the average for the last 23 years. For two of the years, there was a decrease in the area of land under cultivation amounting to almost 150,000 acres, indicating that the work of reclamation has pushed very close to the margin if not beyond it. As a result of the high prices for agricultural products that prevailed during the World War, a great deal of hill land was

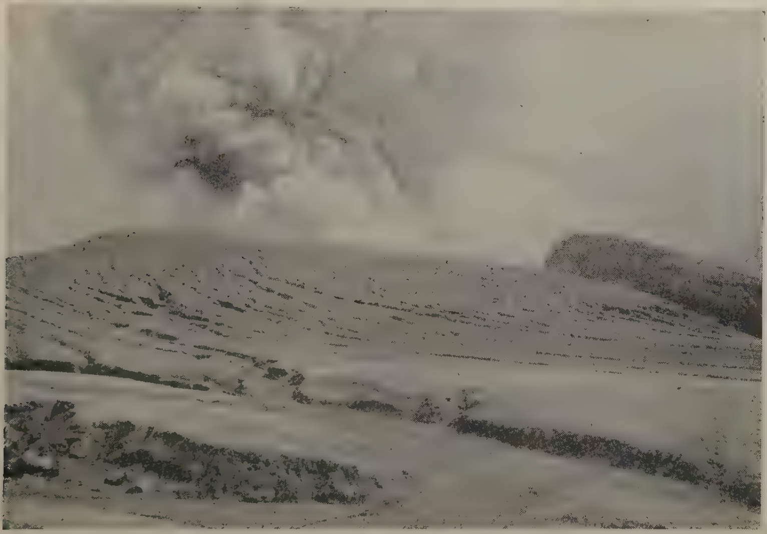

FIG. 10.—The smoke cloud above the new crater of Asosan.

brought into cultivation, but with the declining prices of the postwar period much of it has been abandoned.

It is significant that the area in mulberry is increasing relatively much more rapidly than the area in food crops. The mulberry is grown only on land that is unfit for rice because of soil, topography, or scarcity of water. In the ten-year period, 1918 to 1928, though the absolute increase in the acreage devoted to mulberry and to rice was almost identical, the relative increase in the mulberry area was 20 per cent in comparison with a little over 3 per cent for rice. The total acreage added to the rice and mulberry fields was over three times the actual increase in the area under cultivation, and was made possible by a decrease in the acreage of land in wheat and barley. It is also significant that from 1915 to 1925, 49 per cent of the land newly brought into cultivation and 56 per cent of the increase in rice land have been in Hokkaido, the scantily populated north island.[2]

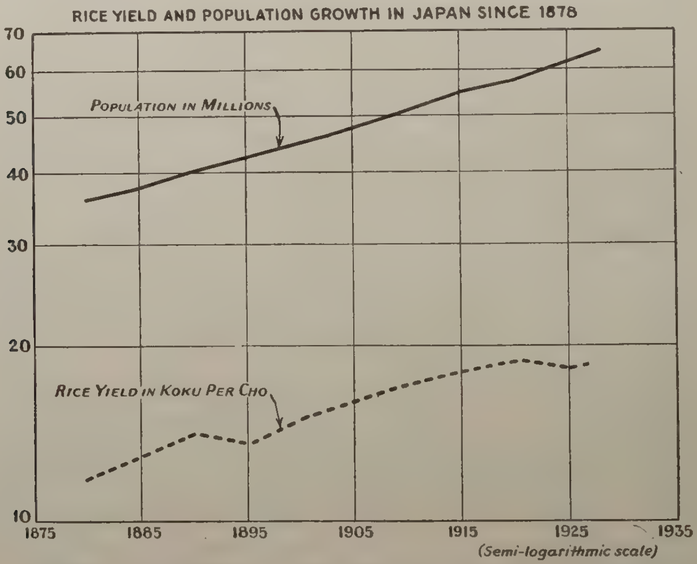

FIG. 11.—Recently, the increase in the yield of rice land per cho has not kept pace with the increase in population. The yield is by five-year averages. (One koku equals 4.96 bushels.)[1]

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[1] Data from Statistical Report of Department of Agriculture and Commerce, *op. cit.*, 1895–1918; Résumé Statistique, *op. cit.*, 1887–1896, 1926, 1927; Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1924, 1925; *Trans-Pacific, op. cit.*, Feb. 6, 1930.

[2] The statistics upon which the estimates and the percentages in the above paragraph are based are from Agricultural Conditions of Japan, 1925 (in Japanese), *op. cit.;* Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1925; and Statistical Abstract of Ministry of Agriculture and Forestry, *op. cit.*, 1928.

That the government does not have too high hopes of reclamation as a solution of population growth is shown by the announced plan of the commission on food and population, appointed in 1926. The commission has proposed the reclamation of only 75,000 acres per year over a period of 25 to 28 years.[1] It is a feeble effort, for that area will add each year only 30,000 farms of the present average size and will support a farm population of not more than 150,000, an insignificant figure in view of the present annual increase of approximately 900,000.

Improvements in Farming Methods

Some increase in agricultural output is to be expected from improvements in farming methods. Since 1880, there has been an increase of 88 per cent in the total production of rice, three-fourths of which has been due to a higher yield per acre and only one-fourth to an increase in area under cultivation.[2] This is a remarkable record, but it does not contain much promise for the future, for it is an indication not only that land is scarce but that the Japanese are already getting the most out of what they have. There would be more hope for further increase if the Japanese had not proved themselves to be such skilful farmers. They

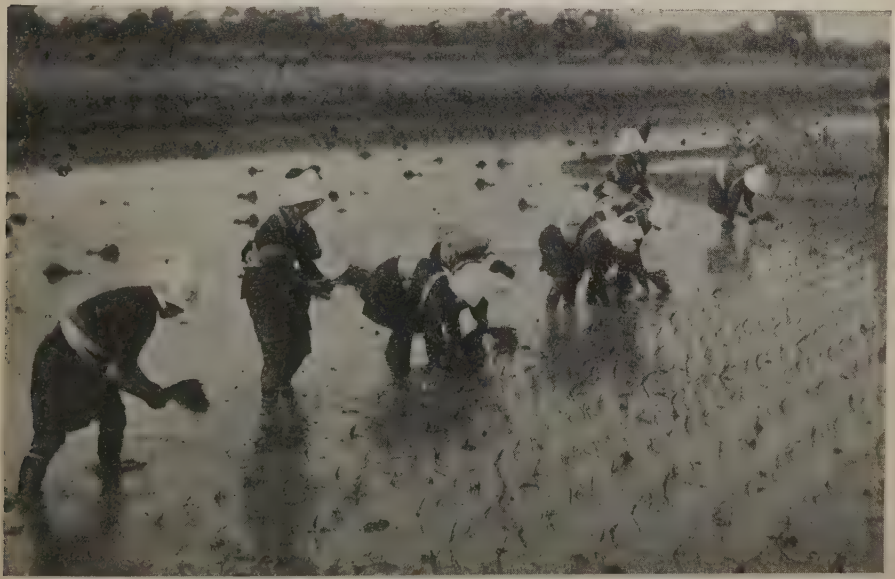

FIG. 12.—Transplanting rice from the nursery bed. Neither machinery nor animals are used in Japanese agriculture. (*Photograph by H. Suito, Tokyo.*)

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[1] *Trans-Pacific, op. cit.*, Oct. 22, 1927. Survey presented to the Food and Population Investigation Commission of the government.

[2] Résumé Statistique, *op. cit.*, 1887; Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928.

have much to teach the western world in the maintenance of soil fertility and in forcing the land to bring forth large yields. The output of rice per acre for the five years 1921 to 1925 averaged 2,350 pounds per acre. In the United States, it was only 1,076 pounds, and in Java, another land of intensive cultivation, it was 927 pounds.[1] From planting to harvesting, Japanese agriculture is carried on almost exclusively by hand without the aid of machinery or even of animals. It is difficult to see how it can be made much more intensive, for, after all, there is a limit to what the land can be made to produce. Already the yield per acre is advancing at a much slower rate than in the earlier years of the modern period (see Figure 11). Certainly, it is not keeping pace with the increase in the population. Japan cannot count upon intensification as a solution of her population problem.

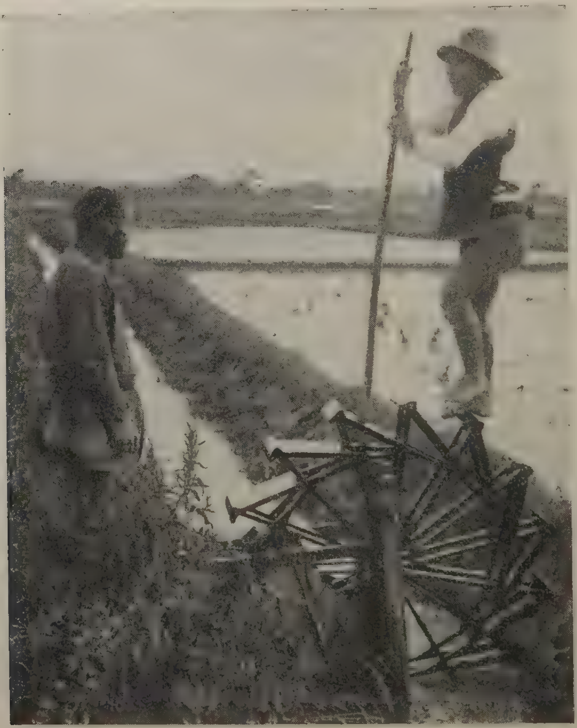

FIG. 13.—The rice fields are carefully irrigated by foot power. (*Photograph by H. Suito, Tokyo.*)

It is probable that the agricultural production of some of the Oriental countries, notably the marginal lands of Manchuria and Mongolia, will be materially increased through the introduction of machinery and large-scale farming methods. There is little hope of any such development in Japan, however, for neither the topography nor the size of the farms favors the use of machinery.

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[1] U. S. Department of Agriculture, Yearbook, 1926.

The Mechanization of Agriculture

The continued mechanization of world agriculture may quite conceivably react not to the advantage but to the disadvantage of Japan. The use of machinery has already extended the limits of agriculture, and new inventions will permit the cultivation of sections of Manchuria, Mongolia, Siberia, Canada, the United States, Argentina, and Australia, now considered marginal or submarginal. Machinery will greatly increase the world output of cereals and, for a time at least, until the population can overtake the new supply, the price of grain may be expected to decline. The agriculture of the older lands, unable for one reason or another to take advantage of the new methods, will suffer as it has always suffered in the past through any revolutionary innovations. The opening of the American West led to the wholesale abandonment of New England farms and to the desertion of the English countryside. Other nations of northwestern Europe, notably France, were unwilling to become dependent upon foreign lands for food, and supported their agriculture against the new competition by means of protective tariffs.

It seems likely that Japan, in the near future, will be forced to follow the choice either of England or of France. Already, there are indications that Japanese agriculture is feeling the competition of lands with cheaper production costs. The Japanese farmer tenants claim that the amount remaining from the sale of their crops, after the payment of the very high rents, is not sufficient compensation for their labor. The landowners, on the other hand, are insisting that their income from the land is inadequate and are seeking relief from the government.[1] If Japan decides to retain her present position of virtual independence in food supply, it will be necessary to extend to her agriculture protection against the cheap grains of lands using machinery. Such protection will raise the price of food in Japan and will add to the cost of living, either depressing the standard of living or necessitating a higher wage level; and manufacturing industry will not look with favor upon higher wages.

If Japan chooses to place no barriers in the way of the importation of cheap foods, agriculture will suffer and Japan may shortly become as dependent upon other lands for food as England has become since the abolition of the Corn Laws in the middle of the nineteenth century. But if agriculture is allowed to decline, some occupation must be found for the population now employed upon the land; and if the country is to be dependent for its food supply upon imports, there must be a very great increase in exports and Japan already has the problem of an adverse balance of trade. The mechanization of agriculture does not appear to offer any relief for the pressure of Japanese population.

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[1] For a discussion of the serious agricultural situation now existing in Japan see Dorothy J. Orchard, "Agrarian Problems of Modern Japan," *Journal of Political Economy*, April and June, 1929, Vol. 37, Nos. 2 and 3, pp. 129–149; 285–311.

POSSIBILITIES OF A CHANGE IN DIET

There is perhaps a possibility of providing for a somewhat larger population by a change in diet. It is even probable that such a change would not only increase the available food supply, but would prove beneficial to the health of the people. Dr. Egerton Charles Grey has recently completed a study of the food problem in Japan for the League of Nations. His preliminary report contains some interesting conclusions.[1] He has found that as far as quantity is concerned there is no shortage of food in Japan and that there has not been at any time since the beginning of the Meiji era. It is his opinion, however, that the Japanese are poorly nourished because of the preponderance of rice in their diet. The large amount of starch so dilutes the protein consumed that excessively large quantities must be taken, thus placing a severe strain on the digestive organs. There is also an absence of fresh or cooked green vegetables and of fresh fruit. The Japanese diet is especially lacking in vitamin foods. There is a great deal of evidence to support Dr. Grey's conclusions. The Japanese physique is slighter than the physique of other Asiatic peoples less dependent on rice. Diseases of the digestive organs account for more deaths than does any other ailment. Certainly, any foreigner who spends any time in a Japanese inn, delightful as they are, finds the diet very trying. It was only after continued insistence that I was able to secure a bowl of cooked carrots, cabbage, and string beans, to accompany the regular meal consisting mainly of fish and rice. A greater dependence on vegetables and fruit would undoubtedly cut down on the demand for rice. The land might be made to yield more starch in the form of the white potato or sweet potato. In recent years, Germany, with much less intensive methods than are practiced in Japan, has been able to secure slightly more starch per acre from potatoes than Japan has secured from rice.[2] The sweet potato is more at home in the climate of Japan than the white potato and it will grow on land too steep and too dry for rice.

Dr. Grey's report has attracted a great deal of attention in Japan. Since it appeared, there has been wide discussion of the possibility of solving the food and population problem through changes in diet, but such changes are not easy to bring about. It is certain that the Japanese

[1] E. C. Grey, *Trans-Pacific, op. cit.*

[2] U. S. Department of Agriculture Yearbook, 1926.

would regard a change from rice as a lowering of their standard of living. It could come only after a long educational campaign or as the result of a food shortage. It is one of the least promising of the proposed solutions for the Japanese population problem.

POPULATION RELIEF THROUGH EMIGRATION

Other nations have sought relief for a too numerous population in migrations into less densely populated lands. The isolation of two centuries and a half had removed Japan from participation in the struggle for dominion that occupied the European powers during the sixteenth, seventeenth, eighteenth, and nineteenth centuries, though it had saved her, perhaps, from encroachments by those nations. When she finally began to look about for new lands to absorb her surplus population, it was a century too late. She was in much the same position as Germany after the formation of the Empire in 1871. Very few parts of the world remained that were not already claimed by one of the great colonizing powers of Europe, and the lands that had not been appropriated were of little value for settlement. Japan lost little time in striving to overcome the handicap of a late start. In 1875, she secured from Russia the Kurile Islands in exchange for her claim to the island of Sakhalin. In 1876, she seized the Lu Chu Islands thus bringing together an island empire that stretched in a narrow chain along the Asiatic coast from the Kamchatka Peninsula on the north almost to Formosa. She was victorious in her first great war, the war with China in 1895, and Formosa and the Pescadores were added to her territory. By the war with Russia in 1904 and 1905, Japan gained a foothold on the mainland of Asia and regained the spoils that the European powers had forced her to surrender at the conclusion of the war with China. She secured a dominant position in South Manchuria and a protectorate over Korea which gave way to annexation in 1910. She also recovered the southern half of Sakhalin, traded to Russia in 1875. By the Treaty of Versailles, Japan was given a mandate over some of the German islands in the South Pacific and acquired the German claims in Shantung—claims which have largely been returned to China.

With all her strenuous efforts to acquire territory extending over more than half a century, Japan has not been able to build up a large empire. Her possessions constitute only about 44 per cent of her total area, and some of her claims are not any too secure. Korea is restless, and Japan has been forced to accede to a number of the Korean demands. One result of a unified China would seem to be a war with Japan to recover Chinese territory that has been seized bit by bit. There are already very evident signs of the approaching struggle in Manchuria. Even if China should remain weak, it is not likely that

Japan will be able to extend her encroachments, for world thought, for the time being at least, seems to be changing and territorial conquests are beginning to be looked upon with disfavor. It is to be hoped that the change is fundamental and permanent and not merely an aversion to war encouraged by those nations temporarily weakened and exhausted by the last conflict and seeking this means of marking time until their recovery permits a renewal of the struggle for territory.

Migrations to Hokkaido

Not only is the Japanese Empire small and held not too securely, but it has not proved to be an effective outlet for an overflowing population. The Japanese have not migrated in any large numbers to the empty parts of the main group of islands, to her outer possessions, or to the controlled zone in Manchuria. For a time Hokkaido, the large island lying to the north of Honshiu, was looked upon as the solution of the Japanese population problem. It has been called the Northland of Japan. Certainly, it is the Japanese frontier area.

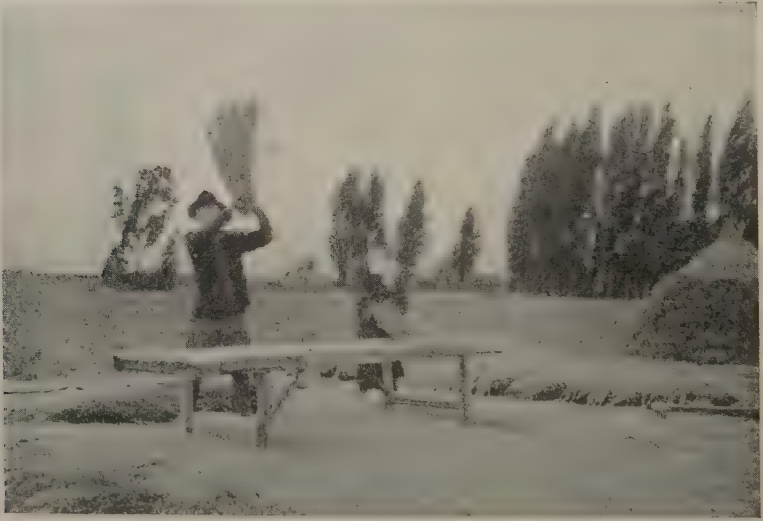

FIG. 14.—Threshing oats. Even in Hokkaido with its larger farms little machinery is used. The heavy clothing is evidence of the rigorous climate.

At the beginning of the Meiji era, Hokkaido was an empty wilderness inhabited only by a few tribes of the Ainu, the aboriginal inhabitants of Japan who after many years of warfare had been driven from the southern islands. In 1869, a Colonial Development Office was created as a part of the new government of Hokkaido. American engineers, geologists, and agriculturists were brought in to build railways, open the coal fields, and assist in the development of the island.

An agricultural college on an American model was established in Sapporo, the capital, and American fruits, vegetables, and grains were introduced. An active campaign to colonize the island was launched by the government. In 1869, the population was 58,000 or under 2 persons per square mile. By 1901, it had increased to over 1,000,000, and by 1925, it exceeded 2,500,000.[1] The migration has been the result of most strenuous efforts on the part of the government. At present, colonists are being given free land, from 12 to 24 acres per family, traveling expenses to Hokkaido are paid, baggage is carried at a low rate, and temporary living quarters are provided.

Despite these inducements, Hokkaido has not been an important outlet for the population of the main islands. In only two years, 1907 and 1917, has the total net increase, including births as well as migrants, exceeded 100,000, and in both 1923 and 1924 the rate of increase per thousand was less than for all of Japan. In 1926, the Hokkaido government announced that the island could accommodate 1,770,000 more people,[2] or less than the increase of Japan for two years. It was also announced that the government planned to send 90,000 farmers a year from Japan to Hokkaido for the next 20 years. There is little probability of the successful execution of such plans unless there has been discovered some new and extremely potent method of encouragement. The Japanese official figures on the population of Hokkaido are confused, but it seems clear that the greatest annual movement into the island was about 38,000 during 1917, 1918, and 1919. In 1924, less than 10,000 migrated into Hokkaido from other parts of Japan, and more than 11,000 returned to the southern islands or to other parts of the Empire. The story is much the same for all of the years since 1920.[3] Either the capacity of the island for absorbing immigrants has been reached or the conditions are not sufficiently inviting to the Japanese.

Hokkaido will play no important part in absorbing the growing population of Japan. The area of arable land is not large and the climate is rigorous with winters much like the winters of New England. The home of bamboo framework and paper screens of southern Japan would be uninhabitable. Heavy timbers or stone or brick must be used, and Hokkaido architecture is more Occidental than Oriental. The charcoal hibachi is scarcely sufficient for heating though it is still used. The farmers are adopting stoves though they are to them strange contrivances. Their use is demonstrated by salesmen each fall in an open-air fair in one of Sapporo's principal streets. The immigrant must make many revolutionary changes in his way of living, and the Japanese have not proved themselves to be a people capable of easy adaptation to unaccustomed and unfriendly conditions.

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[1] Hokkaido, Statistical Bureau, Statistical Report, Part I, (in Japanese), 1924. Also Résumé Statistique, *op. cit.*, 1926.

[2] *Tokyo Nichi Nichi*, June 26, 1926.

[3] Hokkaido, Statistical Report, *op. cit.*

Karafuto

Karafuto, the name given to the Japanese part of the island of Sakhalin, is even less likely to attract Japanese emigrants, for it is several degrees farther north than Hokkaido, and its winters are much more severe due to its position near the Asiatic continent. There is some cultivation of wheat, but the economic life is based almost entirely upon the fisheries, forests, and mines. The total Japanese population is 197,000.[1] In 1924, only 9,218 peasant settlers entered Karafuto from Japan and 4,800 of them were from Hokkaido, the most scantily populated of the main group of islands. In later years, the number of migrants to Karafuto has been even smaller.[2] The Director of Agricultural Affairs of the Sakhalin government recently informed the food and population problem commission of the Imperial government that the island had need of 100,000 workers for the exploitation of coal mines

FIG. 15.—The foreign-style stove has invaded Hokkaido with its New England climate. Its use is demonstrated in the street market.

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[1] Résumé Statistique, *op. cit.*, 1928.

[2] Japan Year Book, p. 498, 1930.

and for the lumber industry, not a very attractive prospect for the warmth-loving Japanese farmer.[1]

Korea

The climate of Korea, the southern part at least, is somewhat more to the liking of the Japanese, but Korea is already rather densely populated, having 229 people per square mile in 1925, and the topography is rugged. The standard of living of the Koreans is lower than the standard of the Japanese. The wage scale is considerably less than the Japanese rate. Korean boys are brought into Japan to serve as helpers in industries where wages must be very low.

The Governor-General of Korea has announced to the food and population commission that an area of 500,000 acres of rice land has recently been developed and that 350,000 Japanese are required to work it,[2] but the Japanese farmer finds it difficult to compete with the Korean farmer. If so much land is available, it is difficult to understand the Korean immigration into Manchuria and the report that Viscount Goto on his trip to Russia in 1927 discussed with the Soviet government the possibility of emigration from Korea to the rice fields of the Siberian Maritime Provinces. It would seem that Korea also is seeking relief for population pressure.

There has been a considerable movement from Japan into Korea, but almost half of the 455,000 Japanese in the country in 1927 lived in the 10 largest cities.[3] They were not farmers; they were merchants, bankers, and officials. Korea may possibly become a source of food and raw materials for Japan, but it will not provide land for the surplus Japanese farmers.

Formosa

Taiwan or Formosa has a moist, hot climate capable of a large production of tea, rice, sugar, camphor, and timber. The Japanese have achieved a considerable degree of success in their subjugation of the natives and in the administration of the island, but the total population of 4,100,000 in 1925 included only 190,000 Japanese.[4] The Director of Colonial Affairs recently stated that Formosa could absorb 300,000 Japanese within the next 10 years.[5] Since 1915, the increase in the Japanese population of Formosa has averaged a little over 5,000 per year.

The outlying parts of the Empire offer little relief for Japan's population problem. Everywhere the emigrant must meet an unfriendly climate, hostile natives, or a population already dense. The pioneer areas are all lands of limited possibilities that can only be brought into use slowly. Even accepting the claims that the heads of the various colonial governments are making to the Imperial government, it would seem that the colonies, including Hokkaido, can absorb in the next 25 years a total of less than 2,500,000 migrants. In view of the evidence at hand, it is likely that these claims are pious hopes from enthusiastic administrators rather than considered estimates of potentialities. The actual figure is undoubtedly much less. If Japan is to solve her problem through migration, she must look beyond the boundaries of her Empire.

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[1] *Trans-Pacific, op. cit.*, Oct. 15, 1927.

[2] *Op. cit.*

[3] Japan Year Book, p. 475, 1930.

[4] Résumé Statistique, *op. cit.*, 1928.

[5] *Trans-Pacific, op. cit.*, Oct. 15, 1927.

Manchuria

At the conclusion of the war with Russia, Japan acquired the Russian lease on the Kwantung Province, an area of 1,300 square miles in the southern part of the Liaotung Peninsula, Manchuria, and also the South Manchuria Railway with control of a very narrow strip along the right of way. The original lease on the Kwantung Province would have expired in 1923, but by the Sino-Japanese Treaty of 1915 it was extended to 1997.

Manchuria was looked upon as the land of promise and the Japanese government early announced its intention of sending 1,000,000 colonists within a period of 10 years into the territory under Japanese control. By 1927, more than 20 years after Japan had taken over the territory, there were only about 68,000 Japanese in Kwantung out of a total population of 740,000, and practically all were in the two cities of Dairen and Port Arthur. In the railway zone, there were 105,000 out of a total population of 309,000.[1] There were not more than 68,000 Japanese in the other parts of Manchuria not under Japanese control, making a total Japanese population for all of Manchuria of only 240,000 in a total population of 27,500,000. There has been a much greater movement from Korea than from Japan, for there are now in Manchuria more than 750,000 Koreans.[2]

It is also significant that only about one-half of the Japanese in Manchuria are agriculturists. The remainder are merchants or are attached to the South Manchuria Railway or to the enterprises that it has established.[3] In 1924, in Kwantung Leased Territory, there were 167,087 Chinese farmers, but only 148 Japanese farmers, according to the Director of the South Manchuria Railway.[4]

A number of reasons have been given for the failure of the Japanese to migrate into Manchuria. Manchuria is a rich land. The area is extensive, the soil fertile, and the proportion of plains much larger than in Japan or even than in China Proper. When the Manchus invaded China and established the Manchu dynasty, they forbade the Chinese to settle in Manchuria, and Manchuria became a closed land. Though on the Chinese plain to the south there was an extremely dense population, Manchuria remained a relatively empty territory and in 1927 had a population density of only 72 per square mile as compared with densities of 295 and 552 in Chihli and Shantung, the Chinese provinces to the south.[1] It invited penetration by the Russians from the north and by the Japanese from the south. Finally, the two powers clashed and there was a division of the territory. The Russians were limited in their sphere of influence to the area along the Chinese Eastern Railway in North Manchuria, and the Japanese became dominant along the South Manchuria Railway and in the south.

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[1] Henry W. Kinney, Modern Manchuria and The South Manchuria Railway Company, p. 41, Dairen, 1928.

[2] The South Manchuria Railway, Report on Progress in Manchuria, 1907–1928, p. 12.

[3] *Osaka Mainichi*, June 30, 1926.

[4] Kimmochi Okura, "Japan's Future in Manchuria," *Japan Advertiser*, p. 5, *op. cit.*, Aug. 12, 1926.

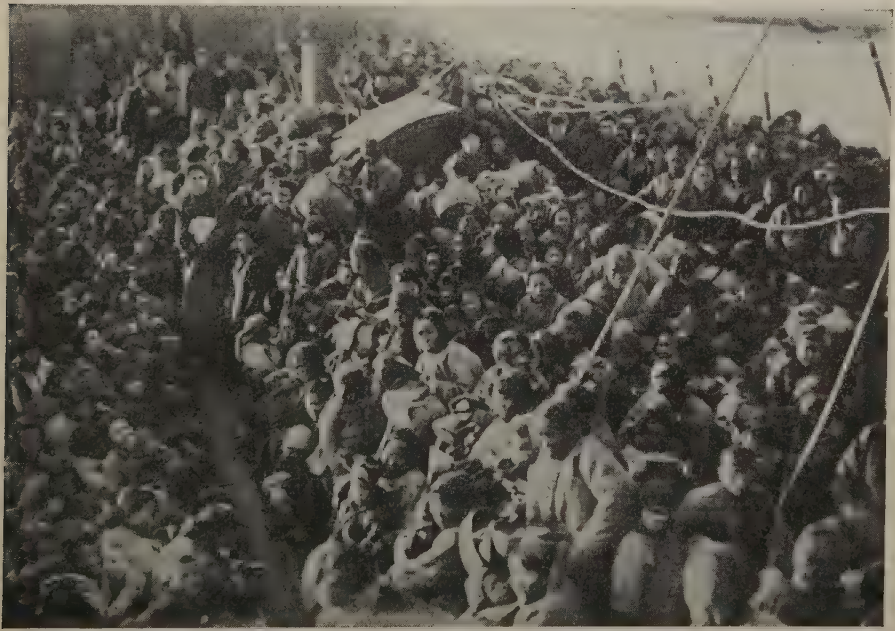

FIG. 16.—Chinese migrants arriving by ship in Dairen on their way to new homes in Manchuria. The group includes many women and children. (*Photograph from Wide World Photos.*)

With the establishment of the Chinese Republic in 1910, the old Manchu restrictions were removed, and Manchuria was thrown open to Chinese migrations. For a number of years there was an annual movement of laborers for the harvests, but most of the workers returned to China at the end of the season. More recently, a flow of permanent settlers with their families has set in, partly because of the disturbing and destructive effects of the many civil wars in China and partly because of famines. The famine of 1927 and 1928 in Shantung Province greatly accelerated the movement. It has been stated on good authority that over a million[1] Chinese are entering Manchuria each year and that more than half of them are remaining as permanent settlers.

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[1] Report on Progress in Manchuria, *op. cit.;* The China Year Book, p. 3, 1926.

The Chinese peasant works for a year or two as a laborer. Then he takes a piece of land and for a time leads a very meager existence. He perhaps digs a cave to serve as a shelter for himself and family until there is time and money to provide a better home. His food supply will be scanty and precarious, but he has always been very close to the margin of subsistence. With such a standard of living, the Japanese farmer finds it impossible to compete.

The climate is more rigorous than the climate of Japan, but it is warm enough to permit the cultivation of rice, and in itself probably would not prevent Japanese migrations. The Japanese also have never been able to establish the practical right to lease land in Manchuria for settlement or for any other purpose. Though one of the Twenty-one Demands of 1915 gave to Japan that right, the Chinese have managed to put effective obstacles in the way of its enjoyment. Even for extensions of the South Manchuria Railway, it has been necessary to secure leases of land through a Chinese, who thus becomes assured of a good income for life.[2] The Chinese farmer who takes land in Manchuria benefits from any increase in value. The Japanese settler cannot enjoy such increment. The impossibility of competition with the Chinese peasants seems to be the fundamental cause of the failure of Japanese settlement in Manchuria, though it is true that the Japanese made no more headway during the period before the present Chinese movement began.

Manchuria is one of the few unexploited regions of the middle latitudes, and its position adjacent to areas of dense population makes it one of the world's danger spots. The stage seems to be set for a colossal conflict with the outcome very much in doubt. The contest for Manchuria, for years a two-sided struggle between Russia and Japan, has now become a three-cornered struggle with the active entrance of China. Russia and Japan have the organization and the military strength; China is badly torn by civil wars, but she has the advantage of proximity and in her migrants a most effective weapon to protect the sovereignty that still remains to her and perhaps even to regain the rights that she has been forced to surrender.

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[1] *Trans-Pacific, op. cit.*, Sept. 24, 1927; C. W. YOUNG. "Chinese Labor Migration to Manchuria," *Chinese Economic Journal*, Peking, July, 1927, published by the Chinese Government Bureau of Economic Information, Peking; KINNEY, *op. cit.*, p. 2.

[2] S. WASHIO, *Trans-Pacific, op. cit.*, Oct. 29, 1927.

If a conjecture may be permitted, China will not be the loser in this struggle. Though the Japanese are inclined to underrate the capacities of the Chinese, it is the Chinese who are making the greater progress in Manchuria. That opinion is beginning to gain ground in Japan. As a Japanese economist recently stated, "If there were ever a hope for Japanese dominance [in Manchuria], it was the first ten years during which we wished to colonize to the extent of 1,000,000 immigrants. It is too late now."[1]

EMIGRATION TO FOREIGN COUNTRIES

Japan has in the past attempted emigration into foreign countries, but the movement has been of far greater significance for the political issues it has raised than for the actual numbers involved. Foreign migrations did not become important until the last decade of the nineteenth century. During the previous 10 years, the largest annual migration to the United States was 640 in 1889 and in 1880 it was only 4. Even during the height of the emigration to the United States just prior to the formulation of the Gentlemen's Agreement of 1907, the average number of Japanese to come to this country annually was less than 18,000, and they were returning home at the rate of about 4,000 per year (see Figure 17).

The emigration to foreign countries has averaged approximately 13,000 annually since 1920 and in the same period almost 15,000 Japanese have returned to Japan each year.[2] There were 640,000 Japanese residing abroad on Oct. 1, 1926.[3] Though the number is small, less than the population increase for one year, it cannot be considered as a measure of emigration, for it includes about 22,000 Koreans and Taiwanese and about 57,000 students, officials, tourists, army and navy officers, and others who are only residing abroad temporarily.[4] The total number of emigrants was therefore approximately 560,000; and of that number 68,000 were merchants, industrialists, and workers in Kwantung Province, in reality Japanese territory. Of the remaining 492,000, 271,000 or 55 per cent, were in the Continental United States, Hawaii, and the Philippine Islands, lands now closed to the Japanese.

There are a number of reasons to explain the failure of the Japanese to emigrate despite the crowding of their population. The lands bordering upon the Pacific Ocean that are seemingly the most suitable for Japanese settlement are for the most part under the control of Englishspeaking peoples, and they now have rigid restrictions, if not exclusion acts, with respect to the immigration of all Orientals. They do not encourage such immigration. On the other hand, the Japanese are a home loving people. They have never shown themselves to be a pioneering people eager to make new settlements or to combat strange surroundings.

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[1] *Op. cit.*

[2] International Labour Office, Studies and Reports, Series 0 (Migration), No. 2 and 4, Migration Movements, 1902–1924, 1925–1927.

[3] Résumé Statistique, *op. cit.*, 1928.

[4] *Osaka Mainichi*, p. 9, June 30, 1926.

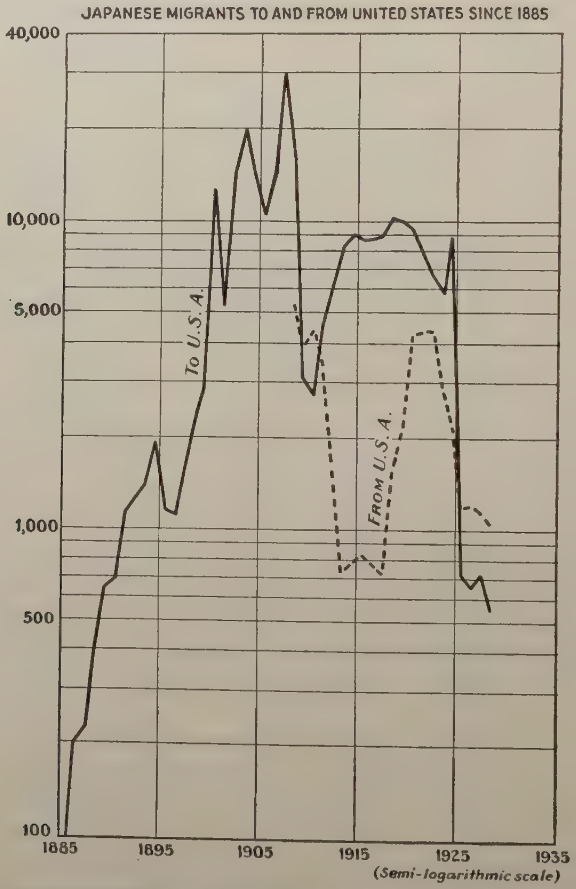

FIG. 17.—The migration of Japanese to the United States has never been very large and in many years it has been offset by the number returning to Japan.[1]

Emigration to Brazil

Only a few suitable localities remain open to the Japanese, practically all of them in South America. Japanese emigration is being directed toward Brazil and to a less extent toward Peru and the Argentine. The movement to Latin America was of no importance so long as the United States permitted the Japanese to enter freely, and even since the Gentlemen's Agreement it has been sporadic. Shortly after the Tokyo earthquake of 1923, the Brazilian government permitted 3,000 Japanese emigrants to enter the country, but in the following year the granting of visas was temporarily suspended by the Brazilian consuls.[1] It has been resumed, but the Brazilian government has indicated several times that it desires only coolie labor and not Japanese who intend to take up land. There were in Brazil in 1927 approximately 65,000 Japanese.[2] The Kaigai Kogyo Kaisha, the most important emigration society of Japan, handled 13,000 emigrants in 1928, or about 90 per cent of the total leaving the country. Of this number, 11,230 went to Brazil. The Ministry of Home Affairs announced in March, 1929, that during the year 15,000 Japanese would be sent to Brazil, 3,000 of them with funds to purchase land and the remainder, coolie laborers with their families.[3]

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[1] Data from U. S. Department of Labor, Annual Report of the Commissioner General of Immigration, 1926, pp. 166, 170; U. S. Statistical Abstract, 1929.

The attention and encouragement that is being given to emigration by the Japanese government are strong evidence of the desperate circumstances of the country. Most elaborate plans have been formulated. Emigrant associations are being organized under the Japanese Foreign Office, and provisions are being made for the physical comfort of the emigrants in their new homes. The Foreign Office is providing a subsidy of 200 yen for each individual, and the Home Office is lending funds for passage money and for the purchase of land; but the funds available are limited, and the present plans provide for only 200 families in three years.[4] Financial assistance is being granted only to those who intend to leave Japan permanently and to become citizens of the countries in which they establish themselves.

To stimulate interest in foreign lands, a colonial museum is to be established in Tokyo, with maps, statistical reports, and commodity exhibits. Colonial or emigrant schools have already been started to train prospective emigrants in the language, customs, resources, and economic possibilities of their future countries. In an effort to break down the Japanese attachment to their homes, it has been proposed that information descriptive of places suitable for settlement within or without the empire shall be introduced into the textbooks of the primary and middle schools.[5] The consideration of such propaganda aimed at a very fundamental trait of Japanese character is significant.

Despite all of the publicity given to the elaborate plans for stimulating emigration, they should be heavily discounted. They have a strong

[1] *Trans-Pacific, op. cit.*, Apr. 27, 1925.

[2] Résumé Statistique, *op. cit.*, 1929.

[3] *Trans-Pacific, op. cit.*, Feb. 21, 1929; Mar, 21, 1929.

[4] *Op. cit.*, Sept. 24, 1927.

[5] *Trans-Pacific, op. cit.*, Oct. 22, 1927; Nov. 5, 1927.

political flavor and are put forward by the party in power to win popular support. Practically every one of the plans has served the same purpose at one time or another in the last quarter of a century, but they have all remained paper plans and the results accomplished are of no importance.

Japan, in reality, places little hope in emigration as a solution of her population problem. Her leaders are fully aware of the fact that few lands remain open to unlimited colonization by Japanese. They know that emigration can absorb only an inconsequential fraction of the annual increase in population. In discussions of the population problem, there occur frequent statements to the effect that "Japan has no promising outlets for her emigration and no great hope can justly be entertained in this direction,"[1] or "the government does not look on emigration as of any importance in solving the question of providing food and a place to live for the constantly growing number of the Emperor's subjects,"[2] or "Japan has no hope for solving her population question through emigration as there is no field where a sufficient number of emigrants could be sent even to keep the present dense population at a stationary figure."[3] In 1926, Reijiro Wakatsuki, then Prime Minister, stated that emigration was so small that more was to be lost than gained by encouraging it because of the danger of inviting the suspicions of foreign nations.[4]

BIRTH CONTROL

The possibility of positive checks on population growth has received serious consideration only within the past year. A few years ago, the discussion of birth control was "dangerous thought" and was hunted out and suppressed by the police as vigorously as communism is today. In the fall of 1926, at a luncheon given by a group of professors of Japan's most liberal university, birth control was mentioned in the course of a discussion of Japan's future and of her population problem. It was dismissed as a method of population control that could never come to Japan since it was so entirely contrary to Japanese ideals. It is significant of the changing trend of Japanese thinking that the professor who voiced the most decided objections to birth control has since declared in a printed statement that it is the only possible solution of Japan's population problem.

It is a change in philosophy that is today very widespread in Japan. The tremendous population increases of the past few years have forcibly emphasized the seriousness of Japan's future. The careful study of the possibilities of agriculture, of migrations within the empire, and of emigration to foreign lands has shown that such outlets are entirely inadequate and that a much more effective remedy must be found. Attention has finally been directed to birth control. It has made little headway with the masses though the Association for the Protection of Maternity has decided to launch a campaign among the poor families of Honjo, a factory section of Tokyo, for the dissemination of birth control information. This is the first time that a woman's organization has taken any active part in the movement.[1] Birth control is being discussed widely in newspapers and magazines. It is openly advocated by many economists. Recently it was debated before a large audience in Tokyo by a professor of the Tokyo Imperial University and a professor of Waseda University.

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[1] From *Hochi* (Japanese newspaper), quoted in *Japan Advertiser*, *op. cit.*, Aug. 1, 1926.

[2] *Japan Advertiser*, *op. cit.*, Aug. 19, 1926.

[3] *Op. cit.*

[4] *Tokyo Nichi Nichi*, June 27, 1926.

Birth control is even being considered by the government though official utterances are strangely inconsistent. At the first meeting of the Food and Population Inquiry Commission in July, 1927, the speech of Baron Tanaka, then Prime Minister, was a breath from the past. Despite the purpose of the commission that he was addressing, he referred to the rapidly increasing population of the Empire as a cause for congratulation and an indication of the future prosperity of the state. In the remainder of his address, in which he reviewed the efforts to increase the food supply, the success of emigration, and the progress of industralization, he found fewer causes for congratulation.[2] Later, in answer to an interpellation in the House of Peers, the Prime Minister denied the accusation that he favored birth control and expressed the hope that the population of Japan would continue to increase.[3]

In marked contrast to the sentiments of the Prime Minister was the statement of Ichiro Hatoyama, Chief Secretary of the Cabinet, at a meeting of the Cabinet and Vice-Ministers held in August, 1927, in the Prime Minister's official residence. Mr. Hatoyama began by declaring antiquated the idea that an increase of population was a sign of national prosperity. He characterized as futile the emigration plans of the government in the face of an annual increase in population of 900,000 and concluded by advocating that more attention be given birth control as a means of checking population.[4]

The Home Office has proposed the enactment of legislation to make birth control compulsory among persons suffering from certain specified diseases and to require certificates of health before marriage.[5] A commission has also been appointed by the government with Inazo Nitobe, a distinguished statesman, as chairman, to study the subject of birth control as a possible solution of the population problem.

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[1] *Trans-Pacific, op. cit.*, Feb. 14, 1929.

[2] *Financial and Economic Monthly, op. cit.*, Aug. 1927.

[3] *Trans-Pacific, op. cit.*, p. 14, Feb. 2, 1929.

[4] *Op. cit.*, Aug. 13, 1927.

[5] *Op. cit.*, Sept. 24, 1927; Dec. 29, 1928.

After a secret investigation carried on at the direction of the mayor of Tokyo, it has been recommended that the Municipal Bureau of Social Affairs give free information on birth control to any poor person having four or more children. The information is not to be given to the wealthy or to newly married couples.[1] In March, 1930, a private birth control clinic was opened in Tokyo under the supervision of Dr. Yutaki Majima, and it was announced that a second was to be opened shortly in Osaka.[2] As yet there has been no official interference with the Tokyo clinic.

In view of the difficult position of Japan, it seems probable that within a few years there will be a complete reversal of government policy on the population problem, and that positive checks on population growth will be advocated and actively encouraged. The strong paternalistic government is well suited to make the experiment with birth control not only for the limitation of numbers but for the improvement of the stock.

INDUSTRIALIZATION

Other countries, notably England and Germany, have provided support for an increasing population through the intensification of the use of their land area by the developing of manufacturing industries. In Japan, industrialization has been actively encouraged by the government since the opening of the modern period, in the earlier years to make the nation strong economically and politically and in more recent years as a means of providing employment for the increasing population and of producing surplus goods to be sent abroad in exchange for food. Industrialization is today, more than ever before, a leading issue in domestic politics. Numerous official commissions have been appointed to investigate the condition of industry, to survey the resources of the country, and to devise methods of encouraging the developing of manufacturing. Industrialization is more than a solution of the population problem. It is the key to the future of the country. Unless there can be a very substantial development of manufacturing industries, Japan cannot hope to be a nation of first rank. In the following chapters, the background of industrialization, its present progress, and its future possibilities will be discussed at length.

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[1] *Op. cit.*, Sept. 19, 1929.

[2] *Op. cit.*, Mar. 6, 1930.

CHAPTER IV

THE INDUSTRIAL BACKGROUND

AGRICULTURE was the dominant economic activity of feudal Japan. It was the basic occupation and most of the population, probably between 80 and 85 per cent of the total, was dependent upon the land for support either directly as farmers or indirectly as samurai and daimyos drawing tribute from the peasants.[1] Agriculture was held to be the very foundation of the state and the source of all wealth. From it were drawn practically all of the government revenues, both local and national. In current economic thought, it was the only occupation considered worthy of encouragement. Other industries were looked upon as consumers, not creators of wealth. The following quotation from the writings of Dazai Shundai, an economist of the early eighteenth century, with its distinctly physiocratic flavor, might have been written by a Quesnay or a Dupont though it does not credit the farmer with any appreciation of his sacred position:

> Agriculture is the foundation of all productivity. All classes are fed by the farmer. When artisans and merchants increase, they merely stimulate the luxury of the people because they produce useless commodities. As the labor of the farmer, however, is essentially disagreeable, farmers are generally anxious to get out of their kind of work. This must be strictly forbidden by law else the production of the necessities of life will fall below the amount required.[2]

The quotation is of added interest because Dazai Shundai died in 1747, nine years before the appearance of Quesnay's first essay on political economy in the Grande Encyclopédie. He seems to have been the Japanese forerunner of the physiocratic school.

THE PRINCIPAL MANUFACTURING INDUSTRIES

But Japan could not live by agriculture alone. Even in the simple economic life of the period, there was a demand for manufactured goods and the demand had necessarily to be supplied largely from within the country since imports were greatly restricted. Industries were numerous and scattered throughout the main islands, but there was no industrial system in the modern sense, and manufacturing with the European form of organization was unknown. Much of the manufacturing was carried on in the homes of the farmers and many farmers made a variety of things only for their own use. Such households tended to be self-sufficient and independent units. Other farmers had specialized to some extent, perhaps because of some easily available resource, and produced a surplus of one or two commodities for exchange, but their main dependence continued to be the land. In certain districts, for example, the reeling of raw silk and the preparation of tea were common subsidiary occupations closely allied with agriculture. Both industries had existed in Japan for many centuries, but they had been hampered by the feudal laws and by the economic stagnation of the country. Their growth and expansion came only with the opening of the country to foreign markets.

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[1] The material for this survey of the industrial background of Japan has been drawn from many sources, the most important being the *Transactions of the Asiatic Society of Japan*.

[2] GARRETT DROPPERS, "Some Old Japanese Economic Theories in the Light of Modern Theories," *Transactions of Asiatic Society of Japan*, Vol. 24, 1896.

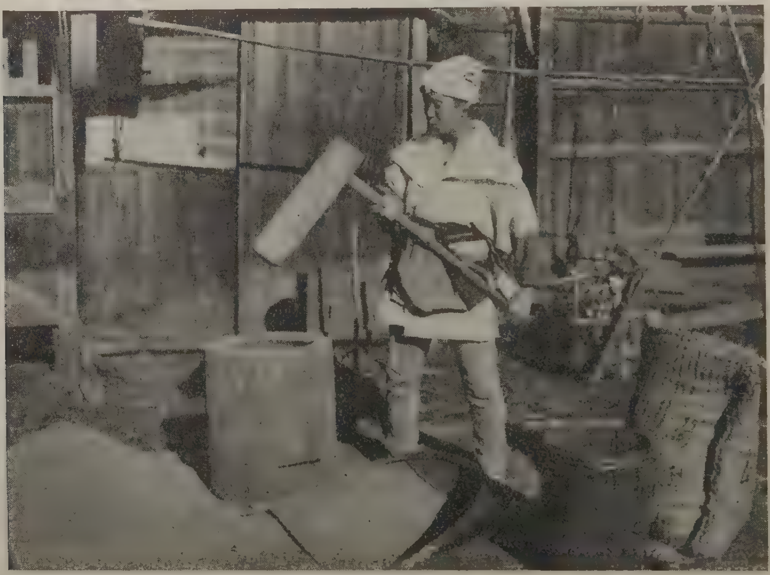

FIG. 18.—Rice was husked in small establishments with primitive wooden mortar and pestle. (*Photograph by H. Suito, Tokyo.*)

There were also artisans no longer attached to the land, but wholly dependent upon their small workshops for their livelihood. They supplied luxuries for the wealthy, and they produced a surprising number of staple articles to meet the every-day needs of all classes. Though much of the food required no manufacturing process and reached the consumer in the form that it left the field of the farmer, there were households or workshops engaged in the husking of rice and in the converting of the rice and buckwheat into long strings resembling macaroni or spaghetti and in the powdering of the ceremonial tea. Others brewed shoyu from soy beans or distilled sake, the common alcoholic drink, from rice or made the many foods and delicacies from fish

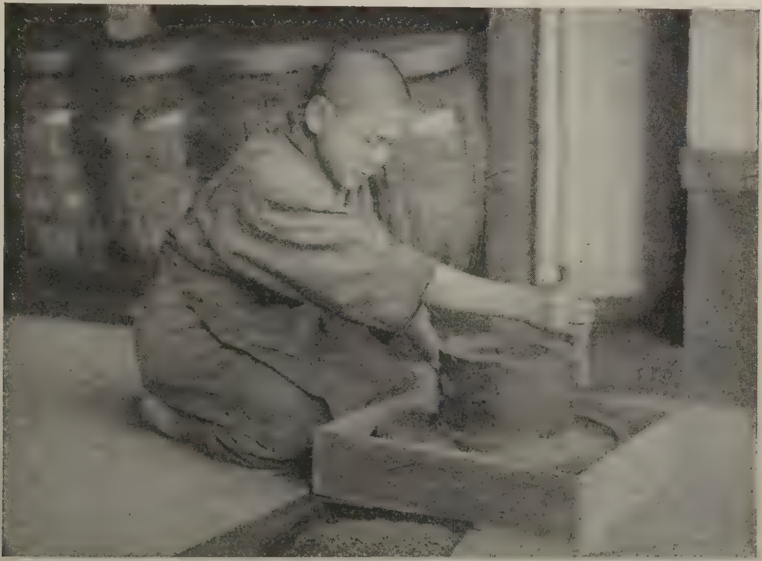

FIG. 19.—The powdered tea leaves for the formal tea ceremony were prepared in small shops. (*Photograph by H. Suito, Tokyo.*)

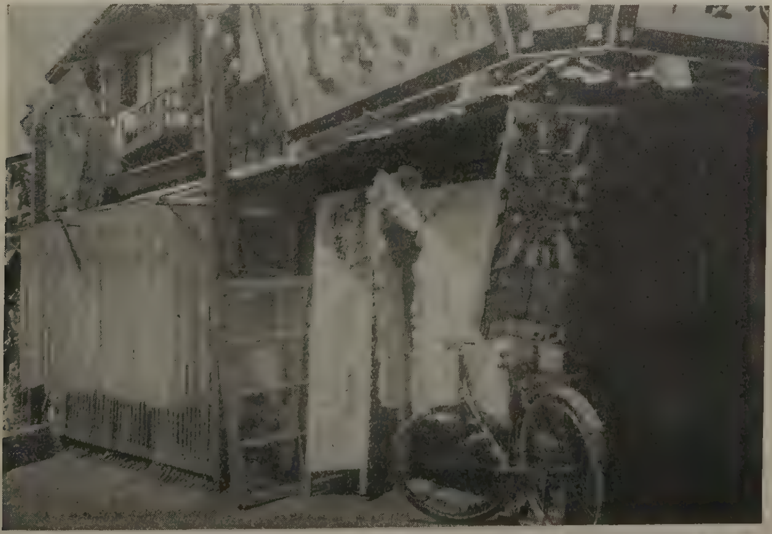

FIG. 20.—Freshly made spaghetti drying in the sun. Much of the Japanese food is manufactured in domestic workshops.

products. These establishments were usually little larger than the home of the manufacturer and were located near the centers of consumption. The largest shoyu factory of today, situated in Chiba Prefecture, claims to have been in continuous existence since 1764 and to have had its origin in a domestic workshop.

Cloth was required for clothing, and though many farmers' wives made all of the cloth consumed by the family, there was some specialization for those who could not or would not weave for themselves. In many cases the farmers' wives who had special skill produced a surplus of cloth which they sold, but there were also small establishments devoted entirely to weaving. Carpentry and cabinet making and mat making were generally specialized crafts, and luxury and art objects, such as lacquer ware, damascene, cloisonné and copper and bronze ware, were created by skilled artisans working in small establishments. The famous swords of the samurai or warrior class were the product of a specialized industry and there were potteries in every village to supply the local needs. The outcastes, or eta class, worked exclusively in tanning and in the making of leather goods.

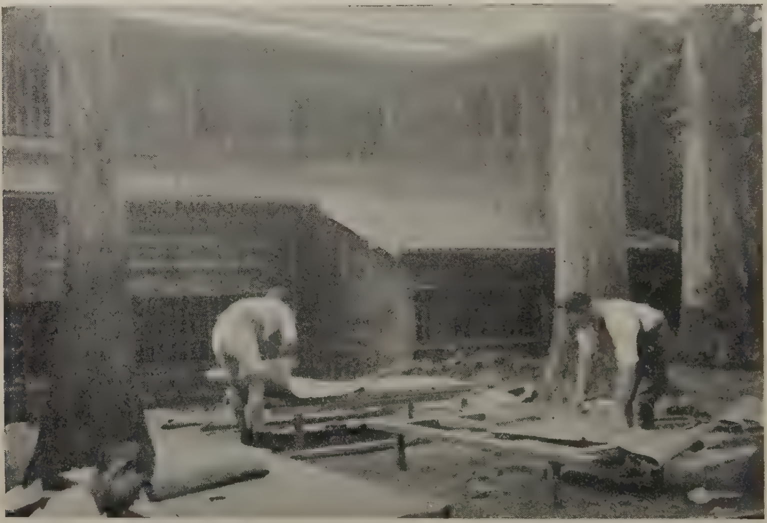

FIG. 21.—The making of mats for flooring is an ancient handicraft industry.

These were the principal manufacturing industries of the feudal period. They supplied food and clothing, and they built and equipped the home. If a Japanese had the means and his rank permitted, they satisfied his desire for the artistic and the beautiful. Beyond such wants, his demands for manufactured goods were few. In the complicated western world of the present day, dominated by an industrial system intent on creating new wants in order that production may be increased in satisfying them, it is perhaps difficult to conceive of so simple a state of society, but it did exist in Japan until it was destroyed in the middle of the nineteenth century by the forced entrance of the insistent mechanical world of the Occident.

During this period of household and workshop manufacturing, the Japanese were not ignorant of the great industrial changes that had occurred in Europe during the previous centuries. On the contrary, they, or at least their leaders, were surprisingly well informed regarding the outstanding scientific and technical achievements of the outside world though intercourse had been restricted since early in the seventeenth century. The Dutch, in their trading post in Nagasaki Bay, had served well in their function as "Merchants of Light" and had brought to Japan many of the notable inventions. The telescope came into practical use in Europe in 1608 or 1609, and within ten years the shogun was able to present one to his son.[1]

The imported inventions and discoveries had little influence on the development of manufacturing. There was no importation of the new machinery or of the new processes of the European Industrial Revolution. Trade was so limited that only articles of luxury could be brought in. They did not enter into the lives of the mass of the people, but were regarded as novelties to amuse the great lords and ladies of the court circles. Even if there had been freer intercourse with the West, it seems probable that changes in industry would have occurred only slowly, for stability was the keynote of Japanese philosophy, and the Japanese believed that their state and society and institutions had been established on principles that were wise and good and not to be improved upon.[2] The existing industries had continued practically without change during the centuries since their first introduction from China or Korea. Processes and tools and organization had remained unaltered. The only marked development had been in the improvement of the skill and technique of the artisans. The West has demanded of the Japanese no change more revolutionary than the disturbance of their belief in the finality and stability of Japanese institutions and methods, for without the supplanting of this static mental attitude, all the other changes—political, social, and economic—would have been impossible.

The industrial system of feudal Japan, if industrial system it can be called, differed from the industrial system of the western nations in four important respects: The consumption of iron and steel was small; the manufacturing industries were in the handicraft stage and used little mechanical power; they were carried on in small establishments, usually in the home; and there was little or no industrial centralization.

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 567.

[2] DROPPERS, "Some Old Japanese Economic Theories," *op. cit.*

THE USE OF WOOD

The scarcity of iron was undoubtedly a serious handicap. The Japanese were highly skilled in the manufacture of swords and armor, and the Japanese sword rivaled the swords of Persia and Damascus in the keenness and temper of its blade. But because of the limited supply and the costs of production, iron did not enter into any use demanding large quantities and it was an unfamiliar medium in manufacturing, transportation, and construction. Wood was the basis of Japanese economy as completely as iron and steel are the basis of the modern European economic system. The dependence upon wood was one of the most characteristic features of Japanese industry and Japanese architecture. The few machines and implements that were used were of the simplest type and wood was the principal material entering into their construction. Stone houses were rare and bricks were not introduced until 1873. Even the supposedly fireproof structures serving as warehouses were a wooden framework thickly coated with mud plaster and roofed with tile. As late as 1873, wooden pipes were used for distribution in the water systems of Tokyo and Yokohama.[1] Only recently, some sections of the wooden conduit were unearthed in Tokyo.

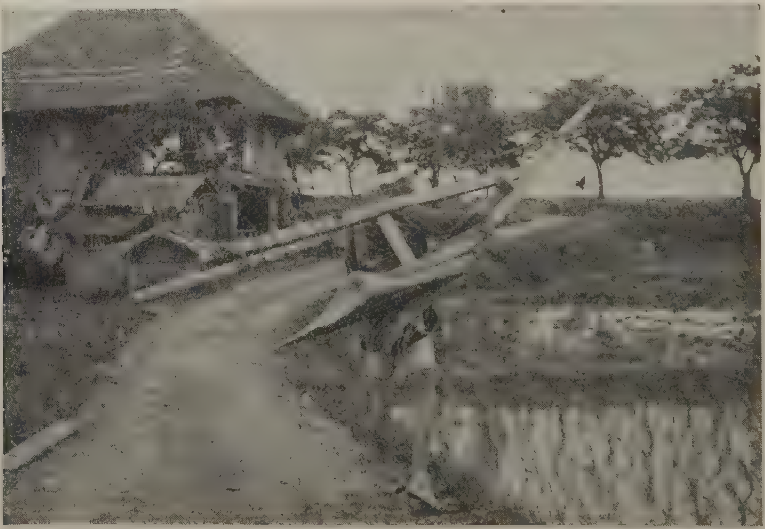

FIG. 22.—The wooden plow continues to be used in Japan, a heritage of the age of wood. Only the tip of the plowshare is of iron. (*Photograph by H. Suito, Tokyo.*)

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[1] R. H. BRUNTON, "Constructive Art in Japan," *Transactions of Asiatic Society of Japan*, Vol. 2, 1873–1874.

Timber was abundant for all uses, but it is not a material that encourages mechanical experimentation or the advancement of engineering knowledge. It does not lend itself readily to the construction of machines with moving parts. To secure strength, bulky and cumbersome pieces are necessary. It is much less uniform in its texture than steel and cannot be tested so easily to determine accurately the burdens and stresses that it will bear.

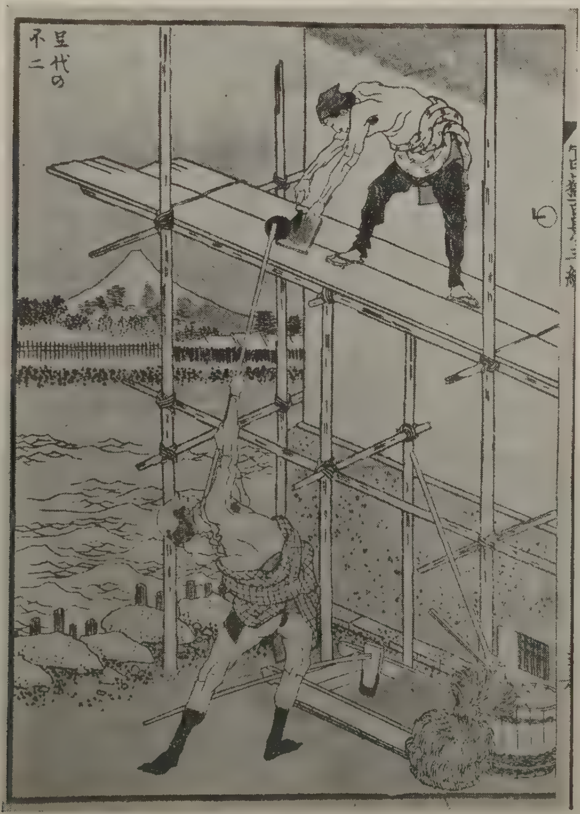

FIG. 23.—The houses were of wood and plaster. Little metal was used in construction as is indicated by the scaffolding lashed together with rope. Scaffolds of the same type are used today in the erecting of the most modern office buildings. (*From an early nineteenth century print by Hokusai in the collection of the Metropolitan Museum of Art.*)

In the construction of their buildings, the Japanese showed little knowledge of the simplest engineering principles though they were highly skilled in cabinet making and in the carving and ornamentation of wood. An engineer, who traveled in Japan in 1873, commended highly the finish of the wood in the buildings, the careful morticing and dovetailing of the joints, the delicate workmanship of the window frames, and the carved ornamentation; but he pointed out serious deficiencies in the arrangement of beams and the sustaining of weights. There was no use made of diagonal struts, and enormous timbers were often supported on beams not more than one-quarter the size they should be. Roofs were usually much too heavy for the supporting framework. No tests were made of the strength or durability of the wood used.[1]

Another writer declared that in the principle of bridge building the Japanese had advanced but little beyond the primitive method of throwing a log across a stream. He attributed their failure to develop braced structures to the high cost of iron and the necessity of using bolts and straps sparingly for the connection of tensional members.[2]

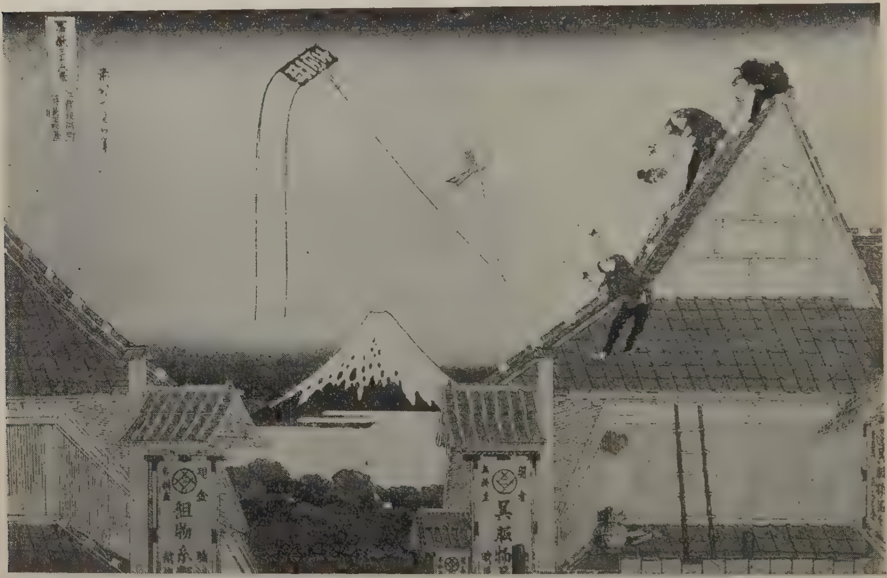

FIG. 24.—Tilers completing a roof. (*From an early nineteenth century print by Hokusai in the collection of the Metropolitan Museum of Art.*)

This dependence upon wood and the scarcity of iron account in large degree for the trend that Japanese industry had taken. The workers were skilled artisans, but they were not mechanics or engineers. The handicraft industries were well advanced, but there had been no progress in machine industries. No transition necessitated by the invasion of European industry was more fundamental than the change from wood to iron. It was more than a change in materials. It was a change from an ancient economy based upon wood and, for that reason, without any mechanical background, to an economy based upon iron and steel and mechanical to the highest degree. It involved the displacement of the artisan by the engineer and the mechanic. It is a transition that even today has not been entirely accomplished, for the Japanese have developed no great mechanical or engineering skill.

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[1] BRUNTON, *op. cit.*

[2] GEORGE CAWLEY, "Some Remarks on Construction in Brick and Wood and Their Relative Suitability to Japan," *Transactions of Asiatic Society of Japan*, Vol. 6, Part II 1878.

INDUSTRIAL PROCESSES

Due both to the scarcity of iron and to the Japanese belief in the superiority of the existing order, industry was still in the handicraft stage. Manufacturing methods differed widely from the methods in use in the industries of Europe. Iron ore was smelted in a small rectangular furnace built of fire clay, approximately 12 feet wide, 15 feet long, and 10 to 15 feet high. The fuel was usually powdered charcoal, though sometimes coke was used, and the blast was provided by a box bellows operated by hand. The smelting was done either with or without flux. The ordinary charge was about 8,000 pounds of iron ore and an equal weight of fuel. From such a charge the output after three days of smelting was about 3,600 pounds of pig iron and 80 pounds of steel. In addition to the actual time of smelting, two days were required for

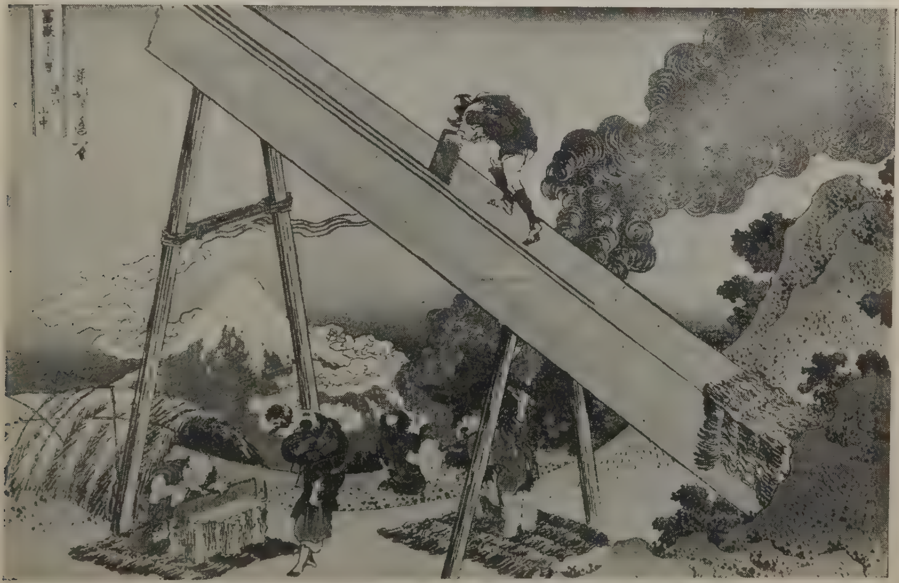

FIG. 25.—The sawyer at work. Planks were cut from logs by hand. (*From an early nineteenth century print by Hokusai in the collection of the Metropolitan Museum of Art.*) Compare Figure 91.

the building of the furnace and three days more for the cooling and removing of the metal and for cleaning up preparatory to rebuilding. Thus, eight days were required for the production of less than 2 tons of metal. The smallest of the blast furnaces in the Imperial Steel Works now turns out 250 tons of pig iron every 24 hours. Though the demands of the country were small, they could not be met by so ineffective a method of manufacture, and even during the period of isolation some iron was imported through the Chinese and the Dutch. With the removal of trade restrictions, iron was one of the first commodities to be imported in quantity. Competition with European methods of smelting was impossible and the iron industry of feudal Japan quickly disappeared with the exception of a few small establishments in western Honshiu that have survived because of the belief of tool makers that Japanese steel is superior to the foreign product.

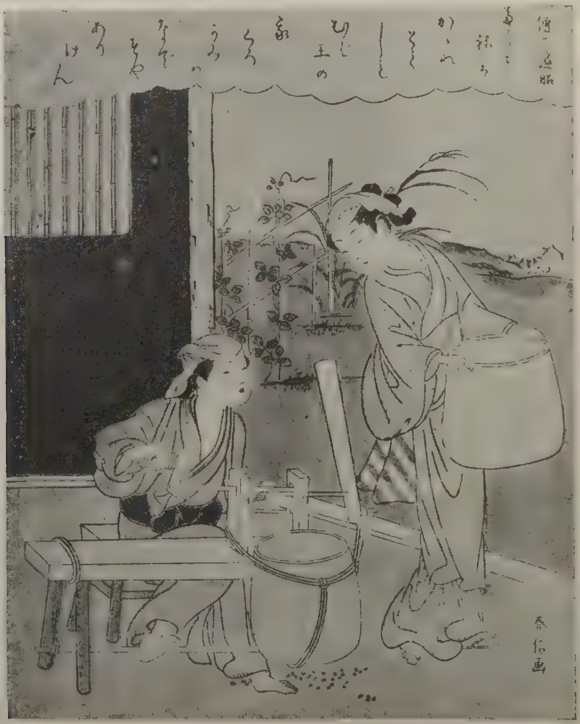

FIG. 26.—The seeds were removed from the raw cotton by passing it between wooden rollers. (*From an early eighteenth century print by Harunobu in the collection of the Metropolitan Museum of Art.*)

Another industry that was completely revolutionized by the opening of the country was the preparation and spinning of cotton. According to legend, the cotton plant was introduced into Japan from India in the ninth century. The similarities in the methods of utilizing its fiber in the two countries would strongly indicate the truth of the legend. The raw cotton was separated from the seed by passing it, one pod at a time, between a pair of wooden rollers, a little over 1 inch in diameter, revolving in opposite directions. The fiber was then carded with a bow very much like the bow still used in India for the renovation of cotton or wool in mattresses. The carding was usually done in the warehouse of the wholesaler of raw cotton in a large room with a smooth wooden floor. The bow was perhaps 3½ feet long and was attached to the ceiling or to a long flexible pole. On the floor a quantity of the cotton was placed and through it the bow string was twanged. The cotton was thus opened up and separated into light fluffy masses which were spread in even layers on oiled paper ready for spinning. In many villages, the monotonous twanging of the bow was a common sound from morning to night. The spinning was done on a small machine with one spindle, much like the charkha of India. It was an even more primitive apparatus than the spinning wheel of American colonial days, for it was not driven by foot treadles but was turned by hand.

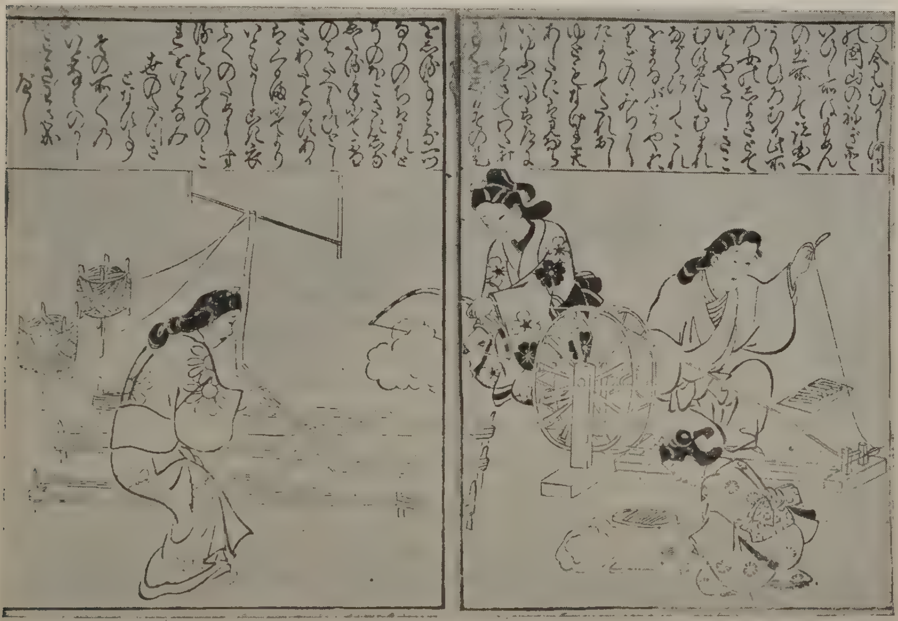

FIG. 27.—Processes in the preparation of cotton for the loom. In the center, the cotton is being carded with a bow; in the right foreground, it is being rolled into spills preparatory to spinning on the hand wheel; at the left, the warp is being laid for the loom. (*From a seventeenth century print by Moronobu in the collection of the Metropolitan Museum of Art.*)

This primitive method of preparing and spinning the cotton has entirely disappeared. Like the Japanese blast furnace, such methods could not compete with the gin, the modern carding machines, and with spinning frames of several hundred spindles operating at high speed.

The changes in the weaving industry have been less drastic and less complete. In feudal Japan, the cloth was woven on a loom worked by hand and foot power and in many parts of the country the hand loom is still an important factor in the production of cloth. In the modern loom, human power was supplanted by mechanical power, and the speed of operation was greatly increased, but there was no such multiplication of the unit as there was in spinning. The transition from the hand loom has occurred slowly and, because of the comparatively small margin of efficiency, the old and the new still continue to exist side by side.

The working in bronze and precious metals and the making of lacquer ware, damascene, and cloisonné are all industries of modern Japan, but they have undergone little change since feudal days. They are still handicraft industries independent of the machine and the factory though in some cases they have succumbed to the demands of the market and, through giving attention to quantity rather than quality of production, have turned out articles of doubtful merit.

In most of the other industries, comparatively few changes in method have occurred. In fact, the industry of modern Japan is characterized not so much by the revolutionary changes that have taken place but rather by its close resemblance to the industry of feudal days. A superficial examination perhaps suggests the occurrence of a complete revolution, but a closer study reveals that the revolution has been confined largely to the iron and steel industry and to spinning.

THE SMALL ESTABLISHMENTS

Not only was industry of the feudal period in the handicraft stage, but it was carried on in very small establishments. There were no factories in the modern sense, probably because the small machines and the absence of mechanical power did not necessitate any concentration into large units and special buildings. Most of the processes were performed within the home of the master workman. He might have apprentices or he might even hire assistants, but more than likely all of his labor would be furnished by members of his own family. Workshops with as many as 30 workers were rare. In the weaving of cloth as many as 10 looms might be assembled in one establishment, but the more usual unit was one or two looms in the home of a farmer operated by his wife or daughters. A traveler in Japan in 1878 wrote that in Hachioji, a silk center near Tokyo, women were working in almost every house at looms or over basins of hot water unwinding the cocoons. In a very few instances, they were assembled in small factories.[1]

Though the establishments were small, there was some division of labor. If the manufacturing process was at all complicated, it was usual for the different steps to be completed in different workshops. It was a division of establishment rather than any division of activity or skill by the individual worker though it did result in that. Raw cotton was usually carded in the warehouse of the merchant, it was spun in the home of one farmer, the yarn was woven into cloth in the home of a second, and the cloth was dyed or finished in the home of a third. There was rather minute division in industries like the making of fans, porcelain, lanterns, and umbrellas.

THE LOCATION OF THE PRINCIPAL INDUSTRIES

The British Industrial Revolution, through its dependence upon mechanical power, had concentrated manufacturing into a comparatively few centers. In feudal Japan, though there were many industries, there were no industrial centers, or rather there were a great many centers. No quantitative measure of either their extent or their distribution is available, but a general survey of the more important industries for about the year 1850 shows that they were distributed through 50 of the 69 governmental districts into which the islands were divided.[2] Only one district, Kyoto, important for six industries, could be considered an industrial center. Only six districts were important for as many as three industries. The survey is by no means exhaustive and does not reveal fully the scattered nature of the industries. It includes only the major industries and those centers that for one reason or another had attained more than local importance. It does not include the weavers, the potters, the makers of food who in every village supplied the local needs.

Japanese industries were so widely scattered for a number of reasons. There was no use of mechanical power in manufacturing and so there was no necessity of concentration upon deposits of coal or at falls on the streams. It is because of their original situation without any relation to power resources that so many Japanese industries are undergoing with westernization such marked changes in location. New industrial centers are developing in close proximity to coal deposits.

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[1] W. G. Dixon, "Some Scenes between the Ancient and the Modern Capitals of Japan," *Transactions of Asiatic Society of Japan*, Vol. 6, Part 3, 1878.

[2] Japan in the Beginning of the Twentieth Century, *op. cit.* The industries selected were copper mining and the manufacture of silk, cotton fabrics, tea, iron and steel, copper ware, pottery, paper, cutlery, lacquer ware, and soy bean products.

There could be little centralization during the feudal period because centralization implies specialization and specialization implies dependence. If the dominant activity of a locality is manufacturing, other economic activities, notably the production of food, must be neglected. The locality then becomes dependent upon other areas for the commodities that it does not produce.

Through specialization, an area may become extremely proficient in the manufacture of a product just as the worker who devotes all his time to carpentry is a better craftsman than the jack of all trades, but the carpenter cannot remain a carpenter if there is not a sufficient demand for his services and an area cannot continue to manufacture a product if there is not a sufficient demand for it. The demand is limited by the extent of the market, and the market depends upon the available transport facilities. Without adequate transportation facilities, the surplus goods of a specializing area cannot be disposed of, nor can the area bring in the products which, because of specialization, are no longer produced locally. In an earlier chapter, it has been pointed out that transportation in Japan during the feudal period was very poor. There was little trade and there could be little geographical division of production. Each area had to be as nearly as possible self-supporting in food and in all things. The country was self-contained and it was made up of many self-contained units. Agriculture was subsistence

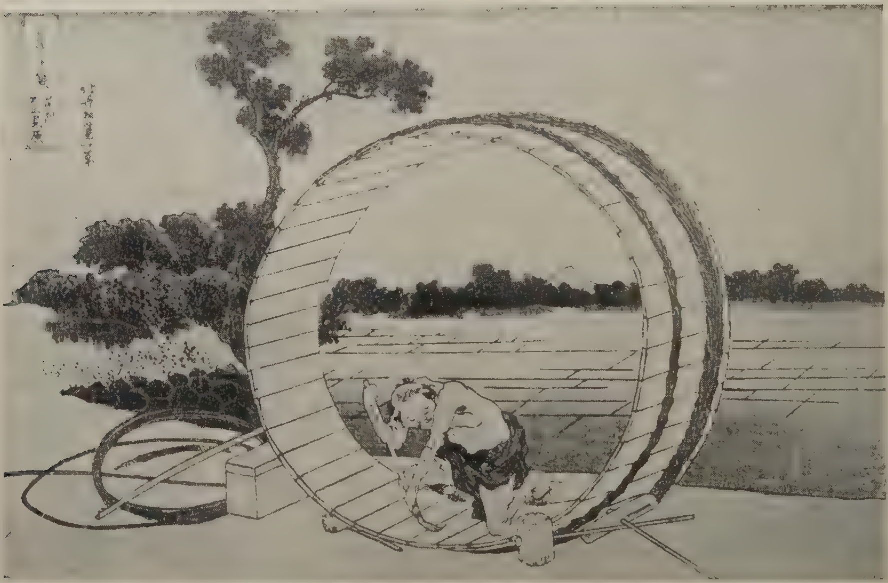

FIG. 28.—The cask maker. (*From an early nineteenth century print by Hokusai.*)

agriculture with little or no specialization, and there was no dependence on foods grown at any distance. Manufacturing for the most part was subsistence manufacturing with the industries scattered throughout the country and supplying only the immediate markets.

The Art Industries

Though decentralization was the rule for feudal industries, there were a few the character of whose products permitted localization. They were the industries producing the art goods that demanded a very high degree of skill. The products were valuable and of small bulk and could be transported even with the limited and expensive facilities available. They were luxuries and not essential to the existence of any region. As in modern Europe, those industries were located in the midst of the taste and culture that surrounded the Court. In Kyoto were gathered the best workmen and to this day that city remains the center for the manufacture of bronze, cloisonné, damascene, and fine jewelry. To the capital, the wealthy lords from all parts of the country made frequent visits and they could carry back with them purchases of Kyoto goods. One of the earliest and most profitable trades in Japan was the supplying of these art goods from Kyoto to the followers of the shogun at his more recently established court in Tokyo.

The Pottery Industry

The localization of industry also depends upon supplies of raw materials. In Japan, this factor was effective in some degree, especially for those industries consuming large quantities of bulky materials. If transportation was inadequate for the carrying of the manufactured products, it was even more inadequate for the transport of raw materials. The bulkier the raw materials and the more limited the supplies of suitable quality, the greater the degree of concentration of the manufacturing processes.

The pottery industry consumed bulky materials and, for the articles of finer quality, was very exacting in its dependence upon deposits of high-grade clay. Its product, however, was bulky, breakable, and difficult to transport. Only the finer articles could be transported and only in their manufacture was there any great degree of specialization. The pottery of ordinary use was made in every village from local deposits of common clay as it is still made throughout India. The centralized industry was in the same class as the making of bronze ware, damascene, and other art goods. It catered only to the wealthy and powerful and its product served as an acceptable gift from one daimyo to another or to the shogun or the emperor's court.

When Kato Shirozayemon, "the father of pottery," returned from his studies of the Chinese pottery industry in 1230, there were no pottery centers of importance in Japan though pottery of rather poor quality was manufactured in almost every locality. He cast about for a suitable location for his establishment and, after experimenting in a number of places, he finally discovered a deposit of pottery clay in Seto village near the city of Nagoya. There he specialized in the making of tea things. The industry at Seto developed slowly probably because the clay was not so well suited to the making of the finer pieces, that were sufficiently valuable to be transported, as it was for the articles of intermediate quality, such as the blue ware for which the village is now famous. In recent years, with the improvement of transportation, the industry at Seto has expanded rapidly and now produces almost one-half of the pottery output of the country. The name Setomono, or Seto ware, has become the generic term for ceramic goods.

The art of making real porcelain was introduced about 1590 by Goradayu Shonsui who had also studied in China. He settled in Arita in northern Kyushu. Following the Japanese invasion of Korea in 1592, a number of Korean pottery makers were brought back as prisoners of war and hostages. Some of them were taken to Arita and that district soon became noted for pottery of high quality, a fame that it still holds to this day. The lord of Satsuma established a village of Korean potters in Kagoshima in southern Kyushu. They originated the Satsuma crackle ware, later made in Kyoto. Other Koreans settled in Kyoto, and the industry there became especially successful because of the immediate market at the Imperial Court. The potters were artists specializing in pieces of the finest quality. They enjoyed the patronage of the emperor and the daimyos and were accorded honors never given even to the wealthiest merchants. Kyoto is at present a center for the production of artistic porcelain. There were also pottery industries of more than local importance in Awaji Island in the Inland Sea and in the prefectures of Ishikawa, Fukuoka, Fukushima, Mie, Shimane, Yamaguchi, and Okayama. Of these only Fukuoka and Ishikawa are now of any significance.

The Iron and Steel Industry

Another group of industries closely dependent upon raw materials was the extraction and working of the metals, especially iron and copper. The two vary so greatly in value and bulk that the same factors do not usually function in determining the location of the industries associated with them, but in feudal Japan they were much more nearly on a parity than at present. Iron was scarce and its use was limited to highly fabricated articles. Copper was relatively plentiful—the only metal of which the islands possessed a rich store.

In view of its dependence upon raw materials, there was much less concentration of the iron smelting industry than might be expected. With the poor transportation of the day, the ore and the fuel could not be shipped and the expense of transporting the metal tended to force each locality, as far as possible, to secure its supplies from local deposits of ore even though they were small and of poor quality. Iron ore has never been plentiful in Japan, but scattered throughout the country are deposits of river sand containing magnetic ore. They are small and of almost no value for modern enterprise, but they could be worked for the local furnaces. Fuel was secured from the forest. At the opening of the modern period, iron was produced in almost every section of the country though the total quantity was probably small, for it did not enter to any important extent into the lives of the mass of the people. They might perhaps have an iron teakettle and a few knives. All of these articles of the commoner sort were fashioned by the village smith from the metal extracted in the neighborhood.

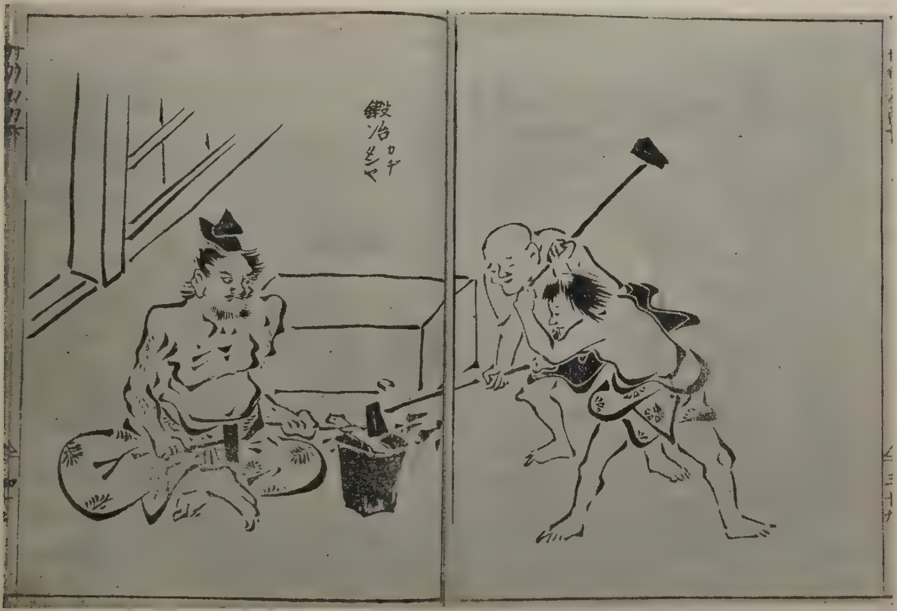

FIG. 29.—In every village, the blacksmith made the few iron implements that were required. (*From an eighteenth century print by Kokan in the collection of the Metropolitan Museum of Art.*) Compare Figures 30 and 66.

Some localities were entirely without raw materials, and despite the difficulties of transport the metal had to be brought in from other districts. Other sections possessed especially rich deposits of ore or abundant supplies of fuel and were able to produce a surplus for the regions of deficiency. Fully one-third of the 69 political divisions of the country had iron smelting industries of more than local importance, but this scarcely constituted centralization though more than half of them were in the western part of the main island where the ferruginous sands washed down from the granite hills were more abundant. Four of the districts, Harima, now Hyogo Prefecture, and Iwami, Izumo, and Hoki, now included in Shimane and Tottori Prefectures, were noted especially for their steel and supplied the famous sword makers of the Court.

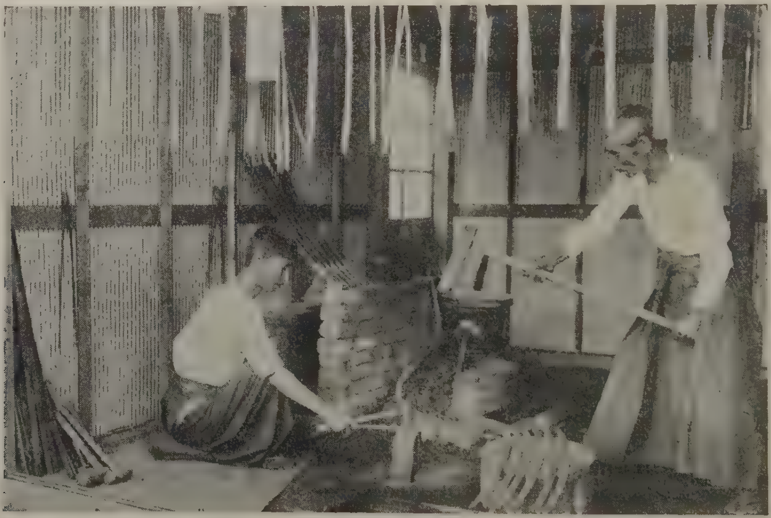

FIG. 30.—Ceremonial swords are still made by the methods of old Japan. (*Wide World Photos.*)

There was a considerable degree of centralization in the industries fabricating the finer iron and steel products. Metal of several qualities was required, and the swords and armor were usually made to the order of some feudal lord or court official. The industries were accordingly located not near the sources of raw materials but near the market. At one period, Kamakura was a center for sword making. Later, the industry was important in Kyoto, Osaka, Okayama, and Tokyo.

Sakai, a village located on Osaka Bay just south of Osaka, was another important steel working center. The industry began there toward the end of the seventeenth century and is of interest because Sakai is today the center of cutlery manufacture for Japan. The location of the industry was not due to any supply of raw materials, for only charcoal and a clay for polishing the swords were produced locally. The steel came from western Honshiu. Sakai was one of the imperial towns and one of the earliest ports opened to trade. The daimyo of the district gave encouragement and active assistance to the steel industry. A market for the swords and armor was provided through the close proximity of Sakai to Osaka, the great grain market of Japan. The daimyos and samurai on their journeys by sea to Kyoto could easily stop at Sakai.

The Copper Industry

There was a somewhat greater degree of centralization in the working of copper than in the working of iron, for copper is less bulky and more valuable and can be transported more readily. The smelting industry, however, was widely scattered. Copper was found in workable quantities and was smelted in as many as 40 districts. Most of the output during the Tokugawa period came from Jii (Wakayama), Echigo (Niigata), and Suruga (Shizuoka). Sakai had a commanding position in the refining of the metal because Sumitomo, a merchant of Osaka, had been taught by a Portuguese how to separate silver from copper and lead. He established in 1590, under an Imperial patent, a metallurgical works at Sakai to which most of the copper produced in Japan was brought for refining. It was perhaps the earliest localization of industry in the country through a monopoly depending upon the possession of a secret process. It was the basis of the wealth of the Sumitomo family, one of the most powerful of the merchant and banking families of the present day.

In addition to its numerous uses within the country in coinage and utensils, for the roofs and ornamentation of temples, and in the alloy bronze, copper was the most important article of export during the period of trade through the Chinese and the Dutch. It is estimated that down to 1700 the Dutch exported over 100,000,000 pounds of copper. At the end of the eighteenth century, they were still exporting 800,000 pounds annually though the amount allowed them had been greatly curtailed by the Japanese officials. At the same time, the Chinese traders were exporting 1,500,000 pounds annually.[1]

In the manufacture of copper ware, the only centralization was in the making of the finer articles in Kyoto and in Takaoka and Kaga on the western coast. As with iron and pottery, the common articles of use were fashioned by local craftsmen.

The Making of Textiles

The weaving of cloth was more widely distributed throughout the country than the metal and pottery industries dependent as they were upon deposits of minerals. Three textiles were used—silk, cotton, and hemp. Before the cotton plant was introduced in the sixteenth century, hemp was used for the clothing of most of the people. It could be grown in almost every section of the country and was usually woven into cloth by the farmer as a subsidiary occupation. Hemp fabrics of especially fine quality were made in Nara, the annual production at the close of the feudal period amounting to about 400,000 pieces, approximately 3,500,000 yards.[1] It was a very ancient industry originating in the period when Nara was the capital of Japan. A fine cloth was woven from china grass in Echigo (Niigata Prefecture) on the west coast.

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 267.

Though cotton was grown widely, the climate of the more southerly districts was better suited to its cultivation and it was there that the greatest quantities of cotton cloth were woven and worn. The districts of Kokura and Kurume in northern Kyushu, Satsuma in southern Kyushu, Iyo in Shikoku, Harima, Kawachi, Yamato, Mikawa, and Shimotsuke in southern Honshiu, and the Lu Chu Islands were especially important. Silk weaving was introduced by Koreans and Chinese in the third and fourth centuries, A.D. In 475, the Emperor summoned the Chinese weavers to his court, and some 19,000 attended. The mulberry can be grown in practically every section of Japan, and the production of raw silk was, therefore, very widespread though the districts of Musashi, Kozuke, Shinano, and Kai, west and north of Tokyo, and Mutsu, at the extreme north of Honshiu, were the principal producing areas. It is a valuable raw material and its transport was not difficult even with the facilities available in feudal Japan. For that reason, there was even less centralization in the production of the silk cloth than in the production of the raw silk. Somewhat the same situation prevails in the world today. A small number of countries produce raw silk, but it is made into cloth in many places. The different cloth manufacturing centers specialized in a particular kind of product. Those near the source of raw material, especially Hachioji, Kawagoe, Fukushima, Kiryu, Ashikaga, and Isezaki made plain silk. Akita, Yonezawa, and Sendai, all in the north, made damasks and figured silks. Nagahama, on Lake Biwa, made crêpe and Hakata in Kyushu sashes. The finest silks, especially damasks and figured cloth, were made in the famous Nishijin district of Kyoto.

THE KYOTO INDUSTRIAL CENTER

An examination of the other industries of feudal Japan would show much the same story. There was little concentration of manufacturing.

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[1] Japan, Imperial Commission to the International Exhibition at Philadelphia, 1876, Catalogue and Notes on Agriculture and Industry, p. 76.

Practically every article of common use was made in the village where it was consumed. In the production of only the finer goods—pottery, metals, or cloth—was there any great degree of centralization and specialization. Because of their high value, such articles could be transported. They could be fashioned only by artisans of great skill. They were manufactured in the centers of taste and culture which were also the principal markets for their sale, for in such centers the wealthy and the lovers of luxuries congregated. It is for that reason that Kyoto was the nearest approach to an industrial center in feudal Japan. The ancient capital was famous for its artists and artisans producing the finest pottery, the best swords, the most beautiful silks, jewelry, cotton cloth, hemp cloth, exquisite metal work in bronze, copper, gold and silver, and the choicest lacquer.

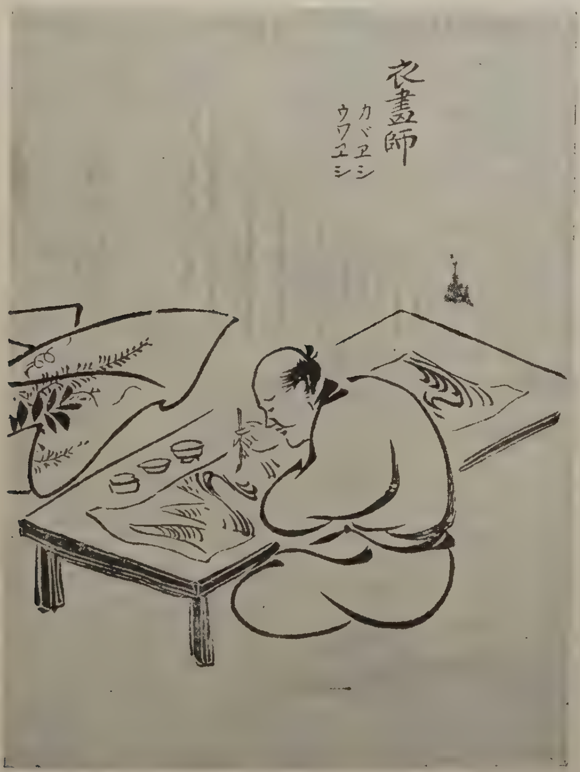
衣畫師
カバヱシ
ウワヱシ

FIG. 31.—A painter on silk. The printing method of the present day differs but little from the primitive hand painting with a brush. (*From an eighteenth century print by Kokan in the collection of the Metropolitan Museum of Art.*) Compare Figure 79.

In 1690, Kaempfer, the German physician and naturalist, visited Kyoto and described the city as follows:

> Miako (Kyoto) is the great magazine of all Japanese manufactures and commodities, and the chief mercantile town in the Empire. There is scarce a house in this large capital where there is not something made or sold. Here they refine copper, coin money, print books, weave the richest stuffs with gold and silver flowers. The best and scarcest dyes, the most artful carvings, all sorts of musical instruments, pictures, japanned cabinets, all sorts of things wrought in gold and other metals, particularly in steel (as the best tempered blades and other arms) are made here in the utmost perfection as are also the richest dresses. And after the best fashion, all sorts of toys, puppets moving their heads of themselves, and numberless other things too many to be mentioned.[1]

Kyoto still retains its preeminent position as the artistic center of the country, but with the shift in the emphasis of industry from quality to quantity the former capital is no longer the industrial center.

THE UNIMPORTANCE OF FOREIGN TRADE

Not only was there little dependence of one section of the country upon another, but Japan, during the feudal period, was a self-sufficient nation. The restricted commerce through the Dutch and the Chinese did not permit the importation and exportation of an extended list of commodities. It could have been completely prohibited with little inconvenience to the country. Detailed accounts of the trade of the feudal period are not available, but the first carefully compiled statistics for 1868, the year of the restoration of the Emperor to power, do serve to show how independent of the rest of the world Japan was.[2] The restrictions on trade had been removed, but no sudden inflow of goods had resulted. The total value of the imports was small, only about 11,000,000 yen ($5,500,000 at the present par rate of exchange). The only important items were raw cotton and cotton and woolen yarn and cloth. They were valued at some 6,000,000 yen, or a little more than 50 per cent of the value of all imports. The other large items were sugar to the amount of 900,000 yen, and muskets, cannon, and cartridges valued at 1,200,000 yen. The list of the remaining imports is very diversified, but the quantities are all small, showing perhaps a curiosity on the part of the Japanese to ascertain the nature of western goods, but certainly indicating no large demand.

The Occident seems to have been more anxious to secure Japanese products, for the exports amounted to almost 16,000,000 yen. Of this total, raw silk, cocoons, and egg sheets constituted 66 per cent, and tea 30 per cent.

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[1] Quoted in T. PHILIP TERRY, Guide to the Japanese Empire, p. 412.

[2] Japan, Department of Finance, Return of the Foreign Trade of the Empire of Japan, 1868–1899.

A COMPARISON OF JAPAN AND EIGHTEENTH CENTURY ENGLAND

The Japan of the feudal period is often compared with the England of the middle of the eighteenth century just before the Industrial Revolution, but though Japan did have numerous industries, the comparison is not apt. English manufacturing was still in the handicraft, domestic stage, it is true, but recognized industrial centers had already developed. The west of England and the piedmont strips on the two flanks of the Pennine Chain were famous, within the country at least, for the production of textiles, especially wool. In the Weald, the Wrekin, the Forest of Arden, and at Sheffield, iron was smelted and fashioned into weapons and agricultural implements. England was importing large quantities of manufactured goods from the continent, particularly from the Low Countries and France. She had a large merchant marine, and her trade had spread to all parts of the world. Her colonial empire was established in America and in Asia. She had successfully met and disposed of the competition of Holland and Spain for world supremacy and her long struggle with France was drawing to a close. She had few characteristics in common with agricultural Japan just emerging from two and a half centuries of isolation.

If a comparison is desired, Japan much more closely resembled the England of two centuries earlier. In the sixteenth century, England was on the frontier of Europe. She was predominantly agricultural with her population concentrated in the southeastern section where climate and soil were more favorable for grains. She had few industries other than local industries subsidiary to agriculture. Her exports were chiefly wool and tin and they were carried not by British ships but by the merchant fleets of continental countries. Even in this early period, England had a greater internal development than had Japan in the nineteenth century, and she had already established a much closer contact with the rest of the world, for under Drake, Hawkins, Frobisher, and the Cabots the foundations of her colonial empire and her naval power were being laid.

When, with the opening of the country, Japan took up the task of industrialization, she was faced with the bridging of a gap not of 100 years but of three centuries. She was called upon to accomplish almost immediately changes that had required three centuries for their consumation in England, but first of all it was necessary to break with a conservative past that had not encouraged change. Her merchants, cut off from the outside markets since the seventeenth century and held in contempt at home, were expected to protect and advance her trade interests. Her industries, dwarfed by agriculture, were still in a static, handicraft domestic stage and evidenced no germ of an industrial revolution. It was a poor foundation upon which to build, but changes were gradually brought about. A new industrial system was established, but it cannot be considered as a descendant or an outgrowth of the industrial system of the feudal period. It was an alien product imported bodily and fully developed just as the telescope and the other curiosities had been imported in the earlier period. It did not extend to all industries, and even today there still exist side by side the two industrial systems—the old traditional industry from feudal days and the new industry imported from abroad. In the following chapter, the efforts to westernize industry during the early decades of the modern period will be described.

CHAPTER V

THE BEGINNING OF INDUSTRIALIZATION COMMUNICATIONS

THE opening of Japan was no voluntary act. It was accomplished only through the mechanical superiority of the western nations. For over two centuries, the country had held aloof from contact with the rest of the world. Except for the trade relations with the Dutch and the Chinese and for a few half-hearted and easily repulsed attempts at intercourse by European powers, Japan had not been molested. When Commodore Perry appeared in 1853, he was received as other foreign visitors had been received and was told that he was unwelcome, but he refused to depart and insisted upon completing his mission.

THE TRIUMPH OF THE MACHINE

Resistance by force might have been attempted, but it could not have been effective. Since early in the century, several of the Japanese leaders had agitated for the reconstruction of the coastal defences on western lines. A few cannon had been purchased from the Dutch and others had been cast in the country. Some were mounted in the forts of Uraga Bay, but there was little ammunition and the cannon were already obsolete when purchased. Though Perry's squadron included only four ships, the largest mounting 16 guns, the governor of Uraga realized that it was entirely too formidable for the defenses at his command, and he wrote to the court of the Shogun at Tokyo that an attack by the American force would expose the complete uselessness of the system of coast defense with most disastrous consequences to the Empire. The Japanese warriors with their beautiful swords, invincible six centuries earlier before the Mongol hordes of Kublai Khan, did not venture to give battle. It was evident to the officials of Uraga and Tokyo that any resistance would be hopeless. Perry remained, and the period of Japanese isolation had come to an end.

In the years that followed before full and unrestricted intercourse was established, it was difficult for the people of the more distant sections of the country, who had had no direct contact with the foreigners, to readjust their ideas of military strength and to realize that their warriors, who for so long had kept the island empire inviolate, were powerless before this new force of ships and machinery that had appeared on their shores. As late as 1859, there came from the isolated Imperial Household in Kyoto a decree ordering the Shogun to perfect the military preparations and to expel the barbarians from the Land of the Gods at the earliest possible date. The Shogun, more familiar with the strength of the foreigners, apparently labored under no such delusions and made little effort to put the decree into effect. In fact, in the previous year, he had written to an official of the Emperor's Court that

> . . . these foreigners are no longer to be despised. The art of navigation, steam vessels, and naval and military preparations have found full development in their hands. A war with them might result in temporary victories on our part, but when our country would be beset by their combined armaments, the whole land would be involved in consequences which we can divine from China's experience.[1]

The reference to China was inspired, no doubt, by the Opium War of 1840 and the annexation of Hong Kong by Great Britain.

Two events that occurred in remote parts of the Empire were very effective in educating the people to the might of the foreign weapons and to the futility of resistance. In 1862, a British subject was killed on the Tokaido Road, the great highway from Kyoto to Tokyo, by vassals of the powerful Satsuma clan. Redress was refused, and in the following year a British fleet appeared off Kagoshima, the Satsuma stronghold. The fleet was fired upon, and in the ensuing bombardment Kagoshima was almost completely demolished. The destruction of the city had the profoundest effect upon the Satsuma leaders. It convinced them of the superiority of the British guns, and from that time on they made every effort to cultivate the friendship of the British and to introduce western methods and inventions into Japan.

The Chōshū clan controlling the Straits of Shimonoseki, separating Kyushu and Honshiu, had also been very contemptuous of the foreigners and had ventured to attack and seriously damage several vessels passing through the Straits. A combined fleet of British, Dutch, French, and American battleships finally bombarded and destroyed the batteries of Shimonoseki in 1864. The Chōshū clan then vied with the Satsuma clan in their friendliness with the British and in their efforts to adopt western ways.

THE JAPANESE DEFENSE

By 1868, the year of the resignation of the Shogun and the restoration of the Emperor to power, the Japanese had been convinced, largely through the frequent resort to the gunboat policy by the British, Americans, and French, that there could be no return to their cherished seclusion and that there must be a break with the unchanging past. Through no choice of their own, they were forced to enter into relations with the other nations. They also realized that this unwelcome change in their policy had been made necessary by the impotence of their Oriental civilization before this mechanical order from the West, and even more significant, they feared further encroachments and humiliations. There were at hand plenty of examples of the treatment of weak countries by the European powers. Most of Japan's Asiatic neighbors had suffered at one time or another. The Philippine Islands had been in the hands of Spain for 300 years. The Dutch had controlled Java completely since 1830 and to some extent since 1705. The dismemberment of China had begun with the establishment of the Portuguese in Macao in 1577. More recently the British had annexed Hong Kong and the French had begun their encroachments in the south that were to terminate finally in the annexation of Indo-China. Raffles, the Englishman, had founded Singapore in 1819 and had negotiated the first of the treaties limiting the independent status of the Malay States. With the suppression of the Sepoy Rebellion in 1857, the British rule in India had been firmly established. Yermak, the Cossack, through his explorations in northern Asia, had long before prepared the way for the extension of the Russian Empire to the Bering Sea. Only a small part of the continent remained free and independent.

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 705.

The Japanese leaders were sufficiently sagacious to realize that their country could be safeguarded from sharing the fate of her Asiatic neighbors only by fighting fire with fire through the immediate and wholesale adoption of European military equipment and methods. Though the supporters of the Emperor in their efforts to restore him to power assumed a strongly anti-foreign attitude, extending even to foreign products, they completely reversed their policy upon attaining their end and Japan began a strenuous period of westernization in government, defense, and industry. The opposition to foreigners was only a rallying cry, seized upon because it appealed to most of the Japanese people and afforded an excellent means of arousing them against the shogunate which had openly recognized the impossibility of continuing isolation and had made treaties with the foreigners and opened ports for their use.

Before this change of front had become a recognized national policy, however, Japan had suffered a considerable loss of sovereignty. By the Shimoda Convention negotiated by Townsend Harris in 1857, it was provided that American citizens were to be exclusively under the control of their consuls and were to be tried by American law. The consular courts and extraterritoriality were perpetuated in the treaties that were entered into in the next few years with the United States, Russia, Great Britain, Holland, and France. These capitulations were agreed to apparently with little opposition at the time, for they were quite in accord with Japanese feudal law which provided that a follower of a daimyo who committed an offense outside the territory of his lord should be turned over to him for trial and punishment. It was only when it was recognized later that the capitulations constituted a surrender of sovereignty which a strong nation would never tolerate that they became a cause of irritation. They were to continue, however, until 1899, and the material progress of Japan in adopting western ways and the successful termination of the war with China probably contributed as much to their final abolition as did the codification and revision of the criminal and civil codes between 1890 and 1898.

The Need of Developing Trade and Manufacturing

As the contact with the other nations widened, the Japanese very soon came to the realization that there was more to fear than territorial encroachments. The early embassies had had as their prime mission the negotiation of treaties of commerce and the opening of Japanese ports to the merchant ships of their nationals. The Occidental nations were there for trade, and the Japanese dreaded economic exploitation as much as they feared the loss of political sovereignty. They had entertained grave doubts of the advisability of even the closely restricted trade through the Dutch and the Chinese. Japan had little to export, and about the only important commodity to leave the country during the centuries of isolation was copper. In the current economic belief, the minerals were compared

> . . . to the bones, and the other revenues of a country to the blood, the flesh, the skin, and the hair which make up the human body. The things with which taxes are paid consist in rice and other cereals, in hemp, in cloth, and in different utensils. They are renewed like the blood, the flesh, the skin, and the hair, while the minerals do not reproduce themselves, as a bone once removed from the body does not grow again.[1]

If there was fear of the collapse of the country through the removal of its skeleton by two nations trading through a single port, how much greater was the danger with many nations trading through many ports.

Many Japanese were convinced that even if other commodities could be found for which there was a demand abroad the resulting trade could not be to their benefit because of its control by foreign merchants and because of the transport of the goods in foreign ships. They did not welcome the import of western manufactured goods and were mercantilists to the extent that they wished to make Japan independent of such imports by developing manufacturing industries within the country. Manufacturing was also considered essential as a part of the military preparations to provide the weapons and munitions for strengthening Japan's defences.

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 497.

It may be safely stated that in Japan it was recognized that the opening of the country had been forced through the mechanical superiority of the West and, furthermore, that the best possible line of defense was the adoption of all that the West had to offer with the least possible delay. One of the Five Articles of the Imperial Oath taken by the Emperor at the time of the Restoration stated that knowledge should be sought throughout the world so that the welfare of the Empire might be promoted.[1]

GOVERNMENT INITIATIVE IN WESTERNIZATION

Since westernization was looked upon primarily as a measure of national defense, it seems quite natural that the government should have taken the leading part in the process. There were other conditions, however, precluding any effective individual action. The fall of the shogunate had brought to a close a period of feudalism that had prevailed for centuries. It was a period that had emphasized the subservience of all to some superior authority—samurai, daimyo, shogun. The many sumptuary laws regulated the lives of the people even in the minutest details. Art, literature, and social intercourse were all rigidly formal and proceeded according to fixed rules. It was believed that Japanese institutions could not be improved upon and change was not encouraged. Individual initiative had been stifled and could not be expected to reassert itself suddenly. Westernization demanded initiative and originality above every thing else, for it involved a complete rebuilding of the economic organization of the nation. The government alone had the knowledge of what was required and only those in power, accustomed to ruling, had retained sufficient initiative to put into effect the imported innovations. During the previous centuries, even the restricted foreign commerce had developed little experience in methods of the West, for it had been a monopoly of the shogun.

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[1] NOBUSHIJE HOZUMO, "The Japanese Civil Code as Material for the Study of Comparative Jurisprudence," a paper read before the International Congress of Art and Sciences, St. Louis, 1904.

Scarcity of Capital

A second condition necessitating government participation in westernization was the scarcity of capital. In the handicraft industries of old Japan, production was based chiefly upon labor. In the new industries, capital, in the form of machinery, was added to the labor. A demand for capital was thus created that could not be met from private sources, and it was necessary for the government to provide the funds and to enter actively into the establishing of the manufacturing industries.

It has been contended that in the Oriental philosophy the disregard of the future and the aloofness from material things militate against any accumulation of a surplus.[1] Perhaps religion and culture did contribute to the shortage of capital, but undoubtedly a more potent factor was the poverty of the country and the pressure upon the means of subsistence. The people were dependent almost exclusively upon a peasant agriculture barely capable of meeting their daily needs. In years of scanty harvest, famines were bound to occur, and even in the best years there was little surplus that could be added to any accumulation of capital to be used later as an agent of production.

The scarcity of capital is to be explained also in the absence during the feudal period of any occupation giving rise to a large moneyed class. England, Holland, and New England had all passed through a prosperous commercial period prior to the development of manufacturing. They possessed a thriving merchant class which had accumulated wealth and supplied the capital for industrialization. Indeed, the merchants established many of the earlier industries to provide new commodities for their trade. There were merchants in Japan, too, but trade, both foreign and domestic, was unimportant, and the merchants were relegated to the lowest social class.

The Inadequate Industrial Background

Still a third reason for the active participation of the government was the character of the industrial background of Japan. The previous chapter has emphasized the width of the gap that separated the industries of feudal Japan and those of the West. They were handicraft industries carried on for the most part in the homes on a small scale. The relations between master and workers were personal, and there were few problems of management. From such a foundation, there could be no immediate transition to western methods. In the new industrial system, artisans were replaced by mechanics and engineers, and with larger units there was a greater and greater division of labor and processes became increasingly more complicated. An administrative skill was demanded that had been unknown in the old order.

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[1] INAZO NITOBE, The Japanese Nation, p. 203.

If time had permitted, perhaps all of these handicaps could have been overcome, and it would have been possible to leave to individual enterprise the development of industry. The freedom of action resulting from the abolition of feudalism would have cultivated in time the necessary initiative. With the removal of all restrictions in trade and agriculture, the productive capacity of the country did increase and gradually a surplus was accumulated that could be diverted in part into manufacturing. From small beginnings, the entrepreneurs would undoubtedly have acquired the skill of management, and the workers the familiarity with machines. But such changes would have taken place slowly and there was no time for delay. It was feared that if Japan did not present a strong front almost at once, she might share the fate of the other Asiatic countries.

Accordingly, the government undertook the task of industrialization. It sought "knowledge throughout the world"; it decided what enterprises should be inaugurated; it established them or furnished the capital for their establishment by private companies; it encouraged technical and scientific training; it imported instructors for the new industries from abroad. So important a part did the government play in the early days that it has never been able to withdraw from industry. It continues to introduce and to support new industries and is looked to for assistance if any difficulties threaten.

The active participation of the government undoubtedly made possible a greater and a much more rapid progress in industrialization than otherwise would have been possible, but it is also responsible for a serious weakness in the present Japanese industrial system. In many ways, Japanese industry shows the effects of its sudden development. It lacks foundation, for there has not been the opportunity for a firm grounding in fundamentals that would have been afforded by a slower but less artificial growth.

BUILDING OF RAILWAYS

One of the most important tasks of the government was the development of a system of inland transportation. It was essential both as a measure of defense and as a means of uniting the country economically. In 1870, there was not a single mile of railway in Japan. The transportation of men and goods overland still depended upon feudal modes of travel—the sedan chair, the pack horse, and man-drawn carts. Heavy goods could be moved long distances only by water and for that reason most of the early industrial development was confined to the coastal towns. In the interior districts, there could be little or no trade. Any manufacturing industries that did develop necessarily were limited for their consuming market to the areas immediately adjacent unless their product was in the same class as raw silk and was sufficiently valuable to be carried economically by the existing means of transport.

Almost as soon as the government was reorganized under the Emperor, plans were prepared for a railway connecting the important cities of Tokyo, Yokohama, Osaka, Kobe, and Kyoto. The national treasury had no funds, and private capital declined to venture into the unknown field. The need was great, however, and in 1870, through the efforts of an Englishman, a government loan of £1,000,000 was floated in London, the first foreign loan of the Japanese government. In the same year, a British engineering corps was engaged and work was started on railways between Tokyo and Yokohama, and Kobe and Osaka. The Tokyo-Yokohama line, 18 miles in length, was completed by 1872 and two years later Kobe was connected with Osaka. By 1876, this line of 20 miles was extended the 26 miles to Kyoto.

These three sections formed the nucleus of the projected Tokaido line which was to run the 376 miles from Tokyo to Kobe. Additional funds were required for extending and connecting these sections and for building lines into the interior of the country, but private capital was not available. A domestic loan for industrial purposes was floated in 1878 and 3,000,000 yen (about $1,500,000 at the present par rate of exchange) of the proceeds was appropriated for railways.

With the exhaustion of the loan of 1878, the government made another effort to persuade private capital to undertake the task of building railways. In 1881, the Nihon Railway Company was organized as a joint stock concern with a capital of 20,000,000 yen ($10,000,000). The company was given the land required for railway construction and the government guaranteed interest payments up to 8 per cent for a period of 10 years on one section and for 15 years on another. In return, the government retained control over all phases of the business and held an option for purchase within a definite period. This pioneer company was successful, and additional private capital was encouraged to undertake railway building. Within 10 years, 15 companies had been chartered and the bulk of construction work was in private hands.

The private lines were aided by guaranteed interest payments of from 4 to 8 per cent on their capital and by government subsidies totaling 12,500,000 yen. Two-thirds of the mileage open to traffic in 1906 had been built by private capital and was under private management.

The Nationalization of the Railways

Though the government policy of encouraging the private companies had accomplished its main purpose—the rapid expansion of the railway system—there had apparently been little supervision, and construction had not been in accordance with any broad comprehensive plan. The lines were scattered throughout the country, and there was no uniformity of service. To make an efficient railway system, it was essential that the unconnected private lines should be extended and unified. The financial failure of some of the private lines emphasized the weakness of the system and tended to discourage the additional investments by private capital required to coordinate and complete it. There was a growing demand for a central management and,

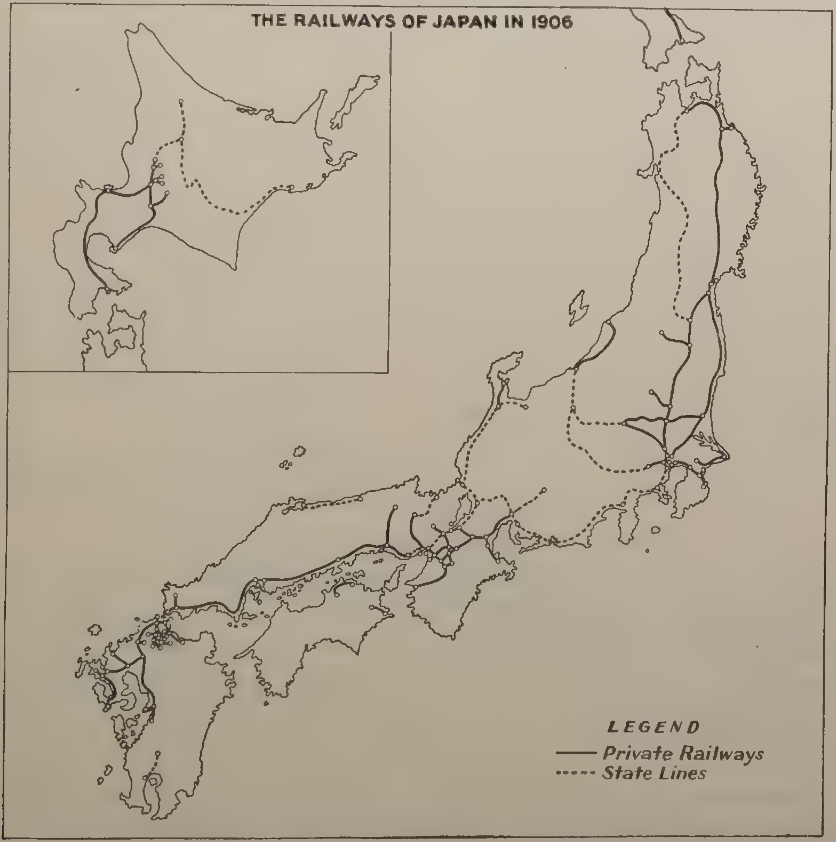

FIG. 32.—The railways of Japan were brought into a unified system under state control with the purchase of the private lines in 1907. There has been a rapid expansion since nationalization.[1]

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[1] Map published in Japan, Imperial Government Railways, Annual Report, 1917, Railway Nationalization in Japan.

in 1906, the law for the nationalization of the railways was promulgated. By 1907, the state had acquired the 17 leading lines and out of a total railroad mileage of 48,000 only 450 miles remained in private hands (see Figure 32). Since 1907, the private companies have been encouraged by means of guarantees and subsidies to build local lines.

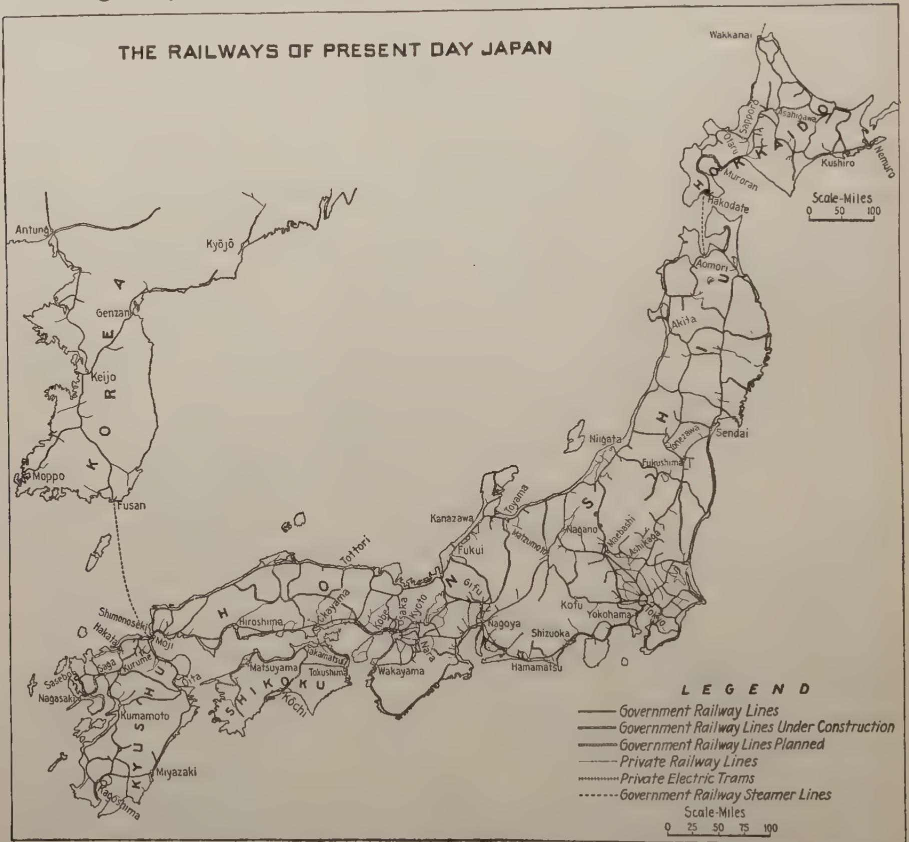
THE RAILWAYS OF PRESENT DAY JAPAN
Wakkanai
Sapporo
Asahigawa
Otaru
HOKKAIDO
Kushiro
Nemuro
Muroran
Hakodate
Scale-Miles
0 50 100
Antung
Kyōjō
KOREA
Genzan
Keijo
Moppo
Fusan
Aomori
Akita
Niigata
Yonezawa
Sendai
Fukushima
HONSHU
Kanazawa
Toyama
Matsumoto
Nagano
Maebashi
Ashikaga
Fukui
Gifu
Tottori
Okayama
Kobe
Osaka
Kyoto
Nara
Nagoya
Kofu
Yokohama
Tokyo
Shizuoka
Hamamatsu
Shimonoseki
Hakata
Moji
Hiroshima
Takamatsu
Matsuyama
Tokushima
Wakayama
SHIKOKU
Kochi
Sasebo
Saga
Kurume
Oita
Nagasaki
KYUSHU
Kumamoto
Miyazaki
Kagoshima
LEGEND
Government Railway Lines
Government Railway Lines Under Construction
Government Railway Lines Planned
Private Railway Lines
Private Electric Trams
Government Railway Steamer Lines
Scale-Miles
0 25 50 75 100

FIG. 33.—The Japanese government has covered the country with an excellent network of railways. The trunk lines, in the main, follow the level topography of the coastal plains.[1]

The length of the privately owned railways had increased to 3,338 miles by 1927 and in 1928 subsidies of over 6,000,000 yen annually were being paid by the government to 70 lines.[2]

The government has proceeded to extend the main lines into untouched sections of the country, to build connecting links where necessary, and to unify the service. The funds have been secured through the floating of loans, and by 1928 over 27 per cent of the outstanding national debt had been contracted for the construction of railways, or nearly as much as the indebtedness incurred for military and naval expenditures. In 1927, Japan had 11,345 miles in state and private railroads, a much longer mileage than that of any other Asiatic country except British India and one that compares favorably even with the mileage of the European countries, as is shown in Table II (see also Figure 33).

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[1] Adapted from map published by Japanese Government Railways, 1927.

[2] *Trans-Pacific, op. cit.*, June 16, 1928.

TABLE II.—RAILWAY MILEAGE OF LEADING COUNTRIES, 1927[1]

Country	Total mileage	Mileage per 1,000 inhabitants	Mileage per 1,000 square miles
Japan	11,345	1.8	77.0
United States	249,131	20.8	83.8
United Kingdom	20,400	4.6	229.9
France	39,552	9.7	185.9
Germany	35,390	5.6	195.5
Italy	13,492	3.2	112.7
China	8,750	.2	4.6
India	39,712	1.2	21.8

[1] U. S. Bureau of Foreign and Domestic Commerce, Commerce Yearbook, Vol. II, Foreign Countries, 1929, pp. 736–737.

THE TELEGRAPH

Both the construction and the operation of the telegraph system have been in the hands of the government from the very beginning. The first telegraph lines were opened as early as 1869, but the system was of little importance before 1878. By that year, 2,828 miles of wire were in operation and the transmission of foreign messages, which had previously been handled by the agents of the Great Northern Telegraphic Company, was transferred to the Japanese system. In the following year, Japan entered the International Telegraphic Union. Since 1886, the telegraph service has been under the control of the post-office department.

THE TELEPHONE

Though there was at first some uncertainty whether the telephone system should be a government or a private enterprise, the earliest telephone service was put in operation by the government in Tokyo and Yokohama in 1890, and the extension of the system to the other parts of Japan and its control and operation have remained in the hands of the government. Japan has telegraph lines with a total length of 31,800 miles operating 184,500 miles of wire and telephone lines with over 2,164,000 miles of wire.[1] In Table III, the Japanese communicaton systems are compared with the communication systems of the United States and of the leading European and Asiatic countries. In Table IV is shown the very rapid rate of growth of the Japanese railways and of the telegraph and telephone lines.

TABLE III.—TELEGRAPH AND TELEPHONE WIRE MILEAGE OF LEADING COUNTRIES, 1927[1]

Country	Telegraph		Telephone	
	Total wire mileage	Mileage per 10,000 inhabitants	Total wire mileage	Mileage per 10,000 inhabitants
Japan	185,074	29.0	2,167,027	339.3
United States	2,152,230	179.3	63,836,182	5,319.1
United Kingdom	363,000	79.6	7,278,000	1,595.2
France	442,000	108.0	2,468,863	603.3
Germany	417,000	65.4	10,608,000	1,664.0
Belgium	25,859	32.3	867,717	1,085.2
Italy	215,362	51.5	715,000	171.1
China	157,615	3.6	88,083	2.0
India	399,515	12.5	337,989	10.6

[1] U. S. Commerce Yearbook, *op. cit.*, 1929, pp. 748–749.

TABLE IV.—GROWTH OF MODERN COMMUNICATIONS IN JAPAN[1] (MILES)

Year	Telegraph, length of wires	Telephone, length of wires	Railways, total mileage open to traffic
1869	19		
1872	451	....	18
1880	9,850	....	73
1890	17,750	....	1,076
1891	20,020	807	1,399
1900	61,690	44,300	3,635
1910	101,500	262,000	5,130
1920	129,500	777,000	8,208
1927	184,500	2,160,000	11,345

[1] Data from Financial and Economic Annual of Japan, *op. cit.*, 1902 to 1928.

SHIPBUILDING

As a part of her transportation facilities, Japan has also made remarkable progress in the building up of a merchant marine. It is a development that is all the more striking in view of the fact that for over two centuries prior to the opening of the country the Japanese were prohibited by law from building ships of more than 100 tons burden. They had had no experience either in the construction or in the operation of the larger sea going vessels, and they knew almost nothing about the art of navigation. Even before Perry's visit, there were indications, however, that the restriction on shipping could not continue much longer. Between 1845 and 1853, the Lord of Satsuma had built secretly two or three vessels of foreign style in his territory at the southern end of Kyushu. Other feudal lords had seen foreign vessels, especially the Dutch ships that touched at Nagasaki, and were convinced that there should be a change in Japanese policy. Finally, in October, 1853, upon the insistence of this group and as a part of the plans to provide a defense against Perry's second visit, the shogunate announced the repeal of the restrictions on shipping that had been decreed by the third and fourth Tokugawas at the beginning of the seventeenth century.

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[1] Japan, Department of Finance, Financial and Economic Annual of Japan, 1928.

The vessel of the Russian admiral, Putiatin, was sunk off Shimada in December, 1854, as a result of damage received from the tidal waves accompanying the great earthquake of that year. Shipbuilding materials were supplied by the Japanese, and two schooners were built to carry the Russian crew back to their home port. In assisting the Russians, the Japanese received their first instructions in the art of modern shipbuilding.

The New Shipyards

In the following year, the King of the Netherlands presented the shogunate with the *Soembing*, a steam paddle-wheel corvette carrying six guns. It was rechristened the *Kanko-Maru*, and was the first vessel of the modern Japanese navy. It was used as a training ship at the newly established naval school at Tsukiji, Tokyo.[1] In the same year, Lord Nariaki of Mito, a bitter opponent of foreign intercourse, but an advocate of the adoption of western methods of defense, built a shipyard at Ishikawajima in Tokyo Bay. Between 1854 and 1859, the shogunate constructed a shipyard and navigation school at Akuura, in Nagasaki Prefecture, where 22 Dutch experts acted as teachers.[2] Another shipyard was begun at Yokosuke near the entrance to Tokyo Bay, but before it was completed the restoration of the Emperor had occurred. The construction was carried on by the new government, however, and the yard was transferred to the navy. A second yard was begun near Nagasaki, in 1874, and 10 years later the two Nagasaki yards were rented and then sold to the Mitsubishi Company. The Osaka Iron Works was established in 1880 by E. H. Hunter, an Englishman, and in 1881 the Kawasaki Dockyard was built in Kobe. At present, Japan has approximately 300 shipyards only 7 or 8 of which, however, are equipped to construct the larger type of vessel.

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[1] MURDOCH, *op. cit.*, Vol. 3, p. 616.

[2] *Op. cit.*

In the earlier years, the Japanese yards worked under serious handicaps. The labor was not skilled, and the management had had little experience. It was possible to build only junks and small steamers. The first large steamer was one of only 6,000 tons built in 1898. During this period, the Japanese merchant marine and the navy depended almost entirely for their expansion upon vessels purchased from abroad, many of them second-hand and not particularly efficient. As late as the five-year period from 1896 to 1900, 81 steamers totaling 200,000 tons were purchased from foreign countries and 253 steamers with a total capacity of 63,952 tons were built in Japan.[1] The foreign vessels averaged 2,474 tons each and the Japanese vessels only 253 tons. During the same years, 640 sailing vessels averaging only 98 tons each were built in Japanese yards.

Since very early in the modern period, financial assistance has been extended to the shipbuilding industry by the government. The Shipbuilding Encouragement Law was passed in 1896 providing for the payment of bounties on iron and steel vessels of more than 700 gross tons constructed in Japanese yards. By 1909, there were in Japan 239 private shipyards and 55 private dockyards.[2] The government was able to place orders in 1912 for the building of two dreadnoughts of 27,500 tons each in Japanese yards. The World War was a further strong stimulus, and there was a great expansion of shipbuilding capacity. It proved to be an overexpansion, however, for in the post-war period many of the yards have had to close down or turn to other activities. One of the largest yards, the Kawasaki Shipbuilding Yard, at Kobe, became so involved in financial difficulties that it was necessary for the government to take it over in 1927 for operation by the Navy Department.

The Merchant Marine

The mere repeal of the Tokugawa shipping laws and the establishment of the shipbuilding yards were not sufficient in themselves to turn the attention of the Japanese to the carrying trade. Apparently, the policy of isolation and restriction had had too firm a hold through many generations, for even though the government, in the years following the Restoration, repeatedly announced that any person might keep any number of foreign-type ships, the Japanese remained skeptical of the possession of the new and large vessels. It was not until 1872 that the first steamship company of any importance, the Nipponkoku Yubin Kisen Kwaisha, was organized. It was followed by other companies all engaged at first in coastwise trade. Two of the companies that had been in desperate competition, the Mitsubishi Kisen Kwaisha and the Kyodo Unyu Kwaisha, were amalgamated in 1885 as the Nippon Yusen Kaisha (the Japan Mail Steamship Company). In the same year, the Osaka Shosen Kaisha (Osaka Mercantile Steamship Company) was organized, and in 1896 the Toyo Kisen Kaisha (Oriental Steamship Company) was established. The last named company operated until 1926 when it was absorbed by the Nippon Yusen Kaisha which is the largest of the navigation companies and controls almost one-fourth of the Japanese merchant tonnage. It maintains a service to Europe, to North America, to the mainland of Asia, and to South America.

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[1] Japan in the Beginning of the Twentieth Century, *op. cit.*, p. 730.

[2] Financial and Economic Annual, *op. cit.*, 1910. In 1909 the subsidy law was amended to apply only to steel vessels of not less than 1,000 gross tons.

TABLE V.—POSITION OF THE JAPANESE MERCHANT MARINE IN WORLD SHIPPING TONNAGE[1]

Country	Gross tonnage of steamers and motor ships	
	1929	1913
United Kingdom	20,046,270	18,273,944
United States	13,591,803	4,302,294
Japan	4,186,652	1,500,014
Germany	4,057,657	4,743,046
France	3,302,684	1,793,310
Italy	3,215,327	1,274,127
Netherlands	2,932,420	1,286,742
China	314,638	86,690
World's Total	66,407,393	43,079,177

[1] Lloyd's Register of Shipping, 1929–1930, Appendix Vol. 2, p. 1176. Excludes ships of less than 100 gross tons and all sailing vessels.

The Japanese merchant marine, including only steam and motor vessels of over 100 tons gross, totaled a little over 4,000,000 tons in 1929,[1] and Japan stood in third place among the countries of the world, though far below the United States in second place and, as shown in Table V, only a very little above Germany, still attempting to recover from war losses, and Italy and France. It is a position that has been secured and is maintained only by the liberal payment of subsidies and bounties by the government. Financial assistance has been given to the shipping companies since their establishment, especially under the Navigation Encouragement Act of 1896 and the Ocean Service Subvention Law of 1909. In the 25-year period from 1902 to 1926 inclusive, the government paid out to shipping companies in subsidies and bounties a total of 207,000,000 yen.[1] For the same years, the total net earnings, including the sums received as subsidies, were 693,000,000 yen, or in other words the subsidies represented approximately 30 per cent of the earnings. But this period includes the extraordinary years of the World War when ship earnings advanced tremendously. If the years 1915 to 1920 are excluded from the period, the earnings of Japanese steamship companies were only 114,000,000 yen and the subsidies 167,000,000 yen. The subsidies have not only paid the net earnings; they have contributed over 50,000,000 yen toward operating expenses. Without government assistance and without the unusual circumstances of the World War, Japanese shipping would have been unable to make the progress that it has in the last quarter of a century and could have been operated only at a loss to the owners.

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[1] Lloyd's Register of Shipping, 1929–1930

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[1] Financial and Economic Annual, *op. cit.*, 1900–1928.

CHAPTER VI

THE BEGINNING OF INDUSTRIALIZATION: MANUFACTURING

THE progress of Japan has been much less remarkable in the development of manufacturing industries than in the introduction of the new means of communication. Railways, steamship lines, telegraph are fundamental to any economic advance. They are so essential to all interests of the state—not only commercial and industrial, but also agricultural, social, political, and military—that the generous use of funds from the public treasury can be easily justified. The material equipment and the skill required for their construction and operation can be imported from abroad. They form a more attractive and a more stable security for public foreign loans than do manufacturing industries. By their nature, they are better adapted to government construction and operation than are the manufacturing industries, for they are less complicated and call for less individual initiative, and they do require centralized administration.

GOVERNMENT ASSISTANCE

The Japanese government has been almost as active in its encouragement of manufacturing industries as it has in the building up of the communication systems, but the results have not been so satisfactory.[1] In the earlier years, it was somewhat hampered by the fact that a protective tariff, the favorite nurse of infant industries, could not be employed. In the treaties of commerce and navigation concluded with the western powers, beginning with the American treaty of 1858, the provisions regarding the tariff were similar to those in effect in China until February, 1929. The import duties were limited to a low rate, and in the tariff conventions of 1866 they were reduced still further. Tariff autonomy was not secured until the general revision of the treaties in 1899. During this most crucial period, Japanese industries were afforded little or no tariff protection from the competition of foreign goods.

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[1] The background of manufacturing in this chapter has been gleaned from many sources. Much of the information has been obtained personally from officials in manufacturing plants of the present day that have descended directly from the pioneer enterprises. Other sources most frequently consulted include: Imperial Commission to the International Exhibition at Philadelphia, 1876, *op. cit.;* Japan in the Beginning of the Twentieth Century, *op. cit.;* Individual contributions to the *Transactions of the Asiatic Society of Japan*, 1872 to 1915; and news items in early numbers of the *Tokio Times*, *Japan Weekly Mail*, and *Yokohama Weekly Mail.*

The Japanese government was forced to find other ways of rendering aid to the new industries. Many were established by the government with the idea of providing an example for private enterprise. The government, or the feudal lords, established the first arsenals, the first silk filature, the first glass factory, and the first chemical works. At one time or another, the government has built and operated porcelain works, silk spinning mills, cotton spinning mills, wool spinning and weaving mills, a linen factory, cement and brick plants, plants for soap making, type founding, and paint making, food factories, iron and steel plants. There are few modern industries in Japan today that do not owe their existence to government initiative. In most cases, the government has endeavored to withdraw from the industries as soon as possible and to turn them over to private companies, but in some cases that has been impossible and the government has continued as an active agent in manufacturing.

A number of industries were started by private companies, but they required government assistance in the form of loans and subsidies. Funds were advanced by the government for the building of the first privately owned cotton spinning mill and also for the first hemp spinning mill. The hemp mill received government aid for several years after it began operation in 1883. The granting of subsidies was so firmly established as an integral part of the government policy toward industry during this early period that it still persists. At present, the government not only extends such aid to infant industries but it is given to older industries that are experiencing difficulties.

Various other forms of government assistance have been given from time to time: the establishment of a silk conditioning house and of experimental laboratories for the silk industry, the purchase and loan of foreign machinery, the provision of lecturers on industry, the establishment of technical schools. The part played by the government cannot be overemphasized. Japanese industry of the present day owes its state of development primarily to the efforts of a highly paternalistic central government.

FOREIGN EXPERTS

One serious deficiency that had to be remedied before any industrial progress could be expected was the almost complete absence of the necessary technical and administrative skill. The admonition of the Emperor that "knowledge should be sought throughout the world" was followed, and students were dispatched abroad to study in universities and in industrial centers, but it was obvious that they could be of little value to Japan for a number of years. Foreign experts were accordingly brought in. The beginning of manufacturing was strikingly similar to the program of industrialization that is being carried forward today in Soviet Russia with the aid of foreign technicians. British engineers built the first Japanese railroads. British workmen assisted in the erection and operation of the early iron works and cotton mills, and British teachers conducted a school in glass making in Toyko. British and American engineers introduced modern mining methods and the use of explosives. French and Italian experts westernized the silk industry, and Swiss were brought in to establish the hemp-braid industry. German experts introduced the brewing industry and later the smelting of zinc and the making of steel and chemicals. French and German specialists were used in the dyeing plants. In 1872, 300 foreigners were employed in the various departments of the government.[1] The Americans contributed comparatively little, but all this development occurred in the period when American manufacturing industry was itself in an immature stage and before the great advance in mechanical development had taken place. For that reason, Japanese industry is today more European than American.

The dependence upon foreign experts was not completely successful. In some cases, the Japanese were undoubtedly imposed upon and the experts possessed no such knowledge as they claimed and were unable to give any real assistance in establishing the new industries. They were even out and out frauds playing upon the ignorance of their employers. In other cases, the Japanese were so conservative and so convinced of the superiority of their own methods that they failed to follow suggestions and to profit by the knowledge that was offered. A more frequent obstacle to the sound introduction of the new system was the keen determination of the Japanese to maintain their economic as well as their political independence. They dismissed the foreign experts at the earliest opportunity, often before they had had time enough to give really adequate training in the new methods of industry. The eagerness of the Japanese to proceed on their own is undoubtedly responsible for a serious flaw in their present-day industrial structure. Their artisans were very clever in mastering the details of a process so that they could repeat it successfully, but their training was not sufficiently thorough to give them a grounding in the fundamentals and to make of them mechanics with the ability to modify, adapt, and develop the methods of manufacture that were brought to them from the West. In many manufacturing plants, processes have continued unchanged since they were first introduced 25 or 50 years ago, unless there has been in the meantime a fresh importation of technique from abroad. The Japanese show many evidences of being good workers, but they are not originators or inventors in things mechanical. The bridging of an economic gap of 300 years was in itself a sufficiently colossal task without attempting to accomplish it with the bare minimum of contact with the masters of the new system.

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[1] *Trans-Pacific, op. cit.*, Oct. 1, 1927.

The steps in the industrialization of Japan can perhaps be presented most vividly through a somewhat detailed account of the introduction of the more significant industries. Though the visit of Commodore Perry precipitated industrialization, it did not begin it, for the westernization of industries was really begun several years earlier. At first, the new industries attracted the great feudal lords because of their promise in strengthening the defenses of the country. The part played by the lords of Satsuma and Mito in building shipyards has already been described. They also established arsenals and as early as 1844, the Lord of Mito incurred the enmity of the Buddhist priests by seizing the bells of many of the monasteries in his fief to provide the metal for his cannon foundries.

THE INDUSTRIALIZATION OF COTTON SPINNING

The two most important industries of modern Japan are the reeling of raw silk and the spinning of cotton yarn. Both, in their present forms, are foreign importations. The spinning of cotton yarn was perhaps the earliest machine industry to come to Japan. The Lord of Satsuma, following the plan of his predecessor, ordered 6,000 spindles from Platt Brothers, of Oldham, England, in 1859. They were installed in a stone building erected in the village of Isonohama near Kagoshima in southern Kyushu, and in 1863 the new mill began operations. An Englishman was engaged as its director. Apparently, unusual care was taken in the selection of the machinery and in the training of the workers, for shortly the cotton yarn from the new factory had attained a reputation for high quality and was being used in the weaving of the well-known "Satsuma katsuri" fabric of Kagoshima. In an effort to promote the spread of modern industry, the Lord of Satsuma established a second mill of 2,000 spindles in Sakai near Osaka. It began operations in 1870 and is now a branch of the Kishiwada Spinning Company.

Before this second mill was established, a cotton yarn merchant of Tokyo, Mambei Kashima, had formulated plans for a spinning mill but because of the disturbances attendant upon the fall of the shogunate, his plans could not be carried forward. After the restoration of the Emperor, Kashima succeeded in securing a subsidy from the newly organized Department of Civil Administration. Further difficulties were encountered in attempting to work the new mill by water power, due to the incompetence of the foreign expert engaged for its construction,[1] but in 1875 the Kashima spinning mill of 720 spindles, located in Oji, a suburb of Tokyo, began operations. This mill is of especial importance because it was the first Japanese spinning mill to be started by private enterprise though it did receive financial assistance from the government.

A spinning factory was built in Okayama in 1871 by the local daimyo to make use of the cotton grown in the neighborhood, but it failed almost immediately due to ignorance of the industry. The building is now occupied by a branch of the Kanegafuchi Spinning Company.

The cotton spinning industry in 1879 presents a rather significant picture of the progress of industrialization in Japan. It was the most active Japanese factory industry and yet 26 years after the appearance of Perry and 16 years after the opening of the first mill there were only three small spinning factories with fewer than 9,000 spindles. Two of them had been established by a feudal lord who had been interested in western industry long before the opening of the country, and the third and smallest, though a private enterprise, had received aid from the government.

Dissatisfied at this rate of progress, the government in 1879 began to encourage the spinning industry more actively and more directly. Orders for spinning machinery were placed abroad and model government mills of 2,000 spindles each were established in Aichi and Tochigi Prefectures. In the next five or six years, similar mills were established in the prefectures of Hiroshima, Nara, Hyogo, Okayama, Mie, Yamanashi, Shizuoka, Miyagi, Osaka, and Nagasaki. These mills were later handed over to private enterprises and those located more favorably have increased in size and have become the nuclei of large companies of the present day.

A larger mill than any existing at the time was established in 1882 in Osaka, and by 1883 its 10,000 spindles, ordered from Platt Brothers of Oldham, England, were in operation. It differed from the other mills in its control, for it was the first Japanese spinning mill to be built by a joint-stock company. This mill marked the beginning of a period of more rapid expansion. With the stabilization of national finances during the decade 1880 to 1890 and the establishment of the banking system, more money was available for investment. All of the spinning companies formed after 1887 were joint-stock organizations. By 1890, the number of spindles had increased to 278,000, or about twenty times the number in 1880, and in the following decades there was an even greater increase.

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[1] Japan Cotton Spinners' Association, Cotton Mills and Workers in Modern Japan, p. 4.

In the early years of its development, the Japanese spinning industry was not able to supply the domestic demand for yarn, and its rate of expansion was not sufficiently rapid to keep pace with the increasing consumption of yarn within the country. When Japan was thrown open to foreign trade, cotton yarn was one of the outstanding imports. During the five-year period 1871 to 1875, it averaged 14,500,000 pounds per year and constituted 15.3 per cent of the value of all imports, being surpassed only by cotton fabrics and wool fabrics.[1] In the following years, despite the introduction of modern spinning machinery, a larger and larger proportion of the increasing consumption was met through the importation of foreign yarn. The imports had increased to 63,000,000 pounds by 1888. Then Japanese purchasing power was curtailed temporarily by a financial stringency, a serious flood, and bad crops. The Japanese spinning industry suffered a severe depression and in May, 1890, the Spinners' Association decided to close all mills for eight days and nights each month for the period from June 15 to Sept. 15.[2] The imports of foreign yarn declined, and with the return of prosperity they continued to decline, for by that time the capacity of the Japanese spinning mills was expanding at a rate more than sufficient to meet the increasing yarn consumption. In 1890, the imports of yarn and the domestic production were almost equal, the imports being 42,400,000 pounds and the domestic production 41,900,000 pounds. From that year, they drew apart rapidly and by 1900 the Japanese production had increased to 262,000,000 pounds, and the imports had declined to 12,000,000 pounds.[3] In later years, the contrast is even greater. The present small imports of 2,000,000 or 3,000,000 pounds per year are the high-count yarns that are not being spun in Japan.

The increase in production was so accelerated that the output of the Japanese mills was soon sufficient not only to supply the home market but also to provide a surplus for export and the spinning industry entered upon the third period of its development. Exports became important in the latter part of the decade 1890 to 1900 in the years immediately following the Sino-Japanese War. The exports of cotton yarn were 4,700,000 pounds in 1895, 17,300,000 pounds in 1896, and 55,900,000 pounds in 1897. Beginning in that year, they exceeded the imports in quantity. By 1905, a level was reached that has been maintained to the present day with a sharp rise during the years of the

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[1] Return of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] Cotton Mills and Workers in Modern Japan, *op. cit.*, p. 5.

[3] Return of the Foreign Trade of the Empire of Japan, *op. cit.*

World War and a drop since 1925.[1] In a later chapter, a discussion of the more recent developments in the cotton spinning industry will be presented.

THE WEAVING OF CLOTH

Though the introduction of modern machines and methods into the spinning industry was a slow process, the westernization of the weaving of cotton cloth was even more belated. The output of cotton cloth increased very substantially, as was evidenced by the greater consumption of yarn both of foreign and Japanese manufacture, but it was an increase accomplished by the expansion of the old household weaving

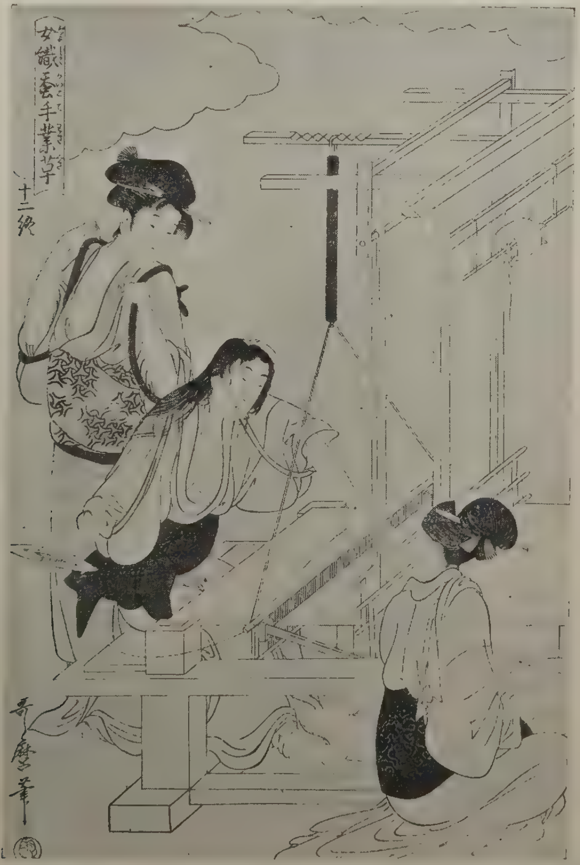

FIG. 34.—Cloth was woven in almost every home on a loom that resembled very closely the hand loom still in use in the rural districts. (*From an eighteenth century print by Utamaro in the collection of the Metropolitan Museum of Art.*) Compare Figure 78.

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[1] *Op. cit.;* Japan, Department of Finance, Annual Return of the Foreign Trade of the Empire of Japan, 1900 to date.

industry making use of the hand loom. The power loom was introduced very slowly. As late as 1900, the Director of the Imperial Commercial Museum, Tokyo, wrote that "in weaving we have no machinery except old-style hand looms kept in every farm house."[1] Out of the total of 770,000 looms on all kinds of cloth, only 26,000 were power looms. It was not until 1923 or 1924 that the number of power looms equaled the number of hand looms, and at the present time much Japanese cloth is woven on hand looms.

The persistence of the old processes and methods in the weaving industry was possible because there was much less difference between the efficiency of the Japanese loom and the modern loom than between the spinning wheel and the spinning frame. In England, the invention of the spinning mule, with its demand for mechanical energy, was the heart of the Industrial Revolution, for it was responsible for the shift of the spinning industry from the home to the factory, for the concentration of manufacturing in cities, and for many of the other radical changes in the cotton industry that occurred in the last quarter of the eighteenth century. Weaving was one of the last steps in the manufacture of cloth to demand improvement and the change, when it did come, was not the invention of a new machine or a new unit of production but the substitution of mechanical power for hand power in an existing machine. With the new processes of spinning, each worker tended not the one spindle of the hand machine, but perhaps 200 or 300 spindles. The new loom still required one worker, though later as skill was acquired one worker might be able to operate two and perhaps even four power looms of the ordinary type. The Japanese government recognized that the changes in cotton weaving were to be much less radical than those in spinning, for government assistance has not been extended to the weaving industry to the same degree that it has to spinning. Few foreign experts have been brought in to teach modern methods of weaving. To a very considerable degree, cotton weaving is still essentially a household industry.

THE REELING OF RAW SILK

A manufacturing industry of even greater significance than the cotton industry in the industrial development of Japan, in the expansion of foreign trade, and probably in its influence on the future of the country, is the reeling of raw silk. In any discussion of industrialization, however, it must occupy a secondary position, for its growth has been characterized by mechanical changes much less revolutionary than those that have occurred in the spinning of cotton yarn. The

[1] H. SATOH, "Japan's Commercial Future," *Transactions Japan Society*, Vol. 5, 1900–1901.

industry became important almost immediately upon the opening of the country to foreign trade, for it provided a staple commodity for export. It will be recalled that many of the Japanese economists of the eighteenth and the early part of the nineteenth century feared any extension of trade, for they believed that it would drain the country of its metals, especially copper. In 1868, however, the first year for which detailed trade data are available, the exports of copper and copper manufactures were valued at less than 35,000 yen and the great export staple was raw silk valued at 6,250,000 yen. Waste silk, cocoons, and egg sheets added another 4,000,000 yen, the silk products thus totaling

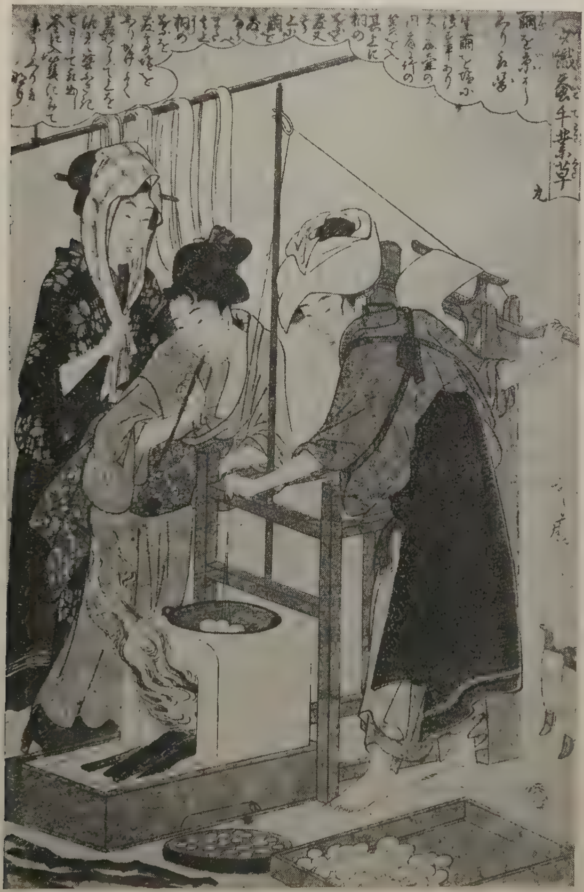

FIG. 35.—The reeling of raw silk has long been a household industry. The process has not altered fundamentally with the introduction of the steam filatures. (*From an eighteenth century print by Utamaro in the C. S. Smith Collection of the New York Public Library.*) Compare Figures 36 and 37.

over 10,000,000 yen, or two-thirds of all the Japanese exports for that year. Since that time, raw silk has held its position as the leading export and even with the diversification of Japanese products it has lost little in its relative standing. In 1868, raw silk constituted 40 per cent of the value of the total exports and in 1928, 37 per cent.[1]

In view of its position as the very foundation of modern Japan, it is surprising that the raw silk industry should have been so neglected during the earlier years of the modern period. From at least two directions, its destruction was threatened. For a time, silkworm eggs were exported so recklessly that the quality of the stock remaining in Japan deteriorated seriously. In the preparation of the raw silk, also, so little care was taken that it soon gained a very unfavorable reputation in foreign markets.

The Export of Silkworm Eggs

The export of raw silk from Japan began in 1859, but the attention of the producers was diverted almost immediately from the silk to the eggs. Beginning in 1853, the pebrine plague had been spreading through the silk districts of France and Italy killing the worms and practically ruining the industry in the two countries. The French and the Italian producers finally turned to Japan for healthy stock to rebuild their industry. Until about 1866 or 1867, they insisted on paying a low price for the eggs and, as a consequence, the Japanese sold only their inferior sheets for export, retaining for use within the country the better qualities for which the Japanese producers were willing to pay. This export did no harm to the Japanese industry. It may even have benefited it by draining the inferior stock out of the country. On the other hand, it certainly did little to improve the European crop. Finally, the French and the Italian buyers began to recognize the importance of selecting only high quality eggs for the production of cocoons and the breeding of stock. They advanced their prices sharply, and a significant change in the trade resulted. The better grades of eggs were exported and the inferior stock remained in Japan for cocoon rearing. The new policy was highly successful in Europe and there was a great increase in the demand for eggs. In Japan, the production of the egg sheets for export became a very profitable industry. It attracted to it many samurai, members of the old warrior class who had lost their occupations and their incomes with the fall of feudalism. For a time, the trade was so profitable that the Peninsular and Oriental Steam Navigation Company ran a special steamer to carry the egg sheet buyers back to Europe with their purchases. In 1867, the exports were approximately 500,000 sheets and in 1868 they had increased to 1,886,000 sheets. From that point, they declined slowly to 1,000,000 sheets in 1876, and then more rapidly to 530,000 sheets in 1880 and 4,800 sheets in 1886.[1]

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[1] Return of the Foreign Trade of the Empire of Japan, 1868–1899, *op. cit.*; Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1900 to date.

It was evident that this export of the good stock was harmful to the raw silk industry and to the quality of its product, and during the period of maximum export there were numerous complaints. The Chamber of Commerce of Yokohama pointed out that it was leading to the complete deterioration of Japan's most important industry. The government finally attempted to limit the trade, but the resulting outcry from both the foreign buyers and the Japanese producers was even more vehement than the protests against the export of the eggs, and the restrictions were removed in 1877. The salvation of the Japanese silk industry came in a few years, however, from the offending countries themselves. After the diseased worms had been replaced by the healthy stock from Japan, Pasteur with his microscope discovered a method of controlling the pebrine plague, and after 1883 the importation of fresh stock was no longer necessary. There was for a time considerable hardship in the silk district of Japan, for there was no market for the eggs produced so carefully, and the producers could not shift immediately to the reeling of raw silk or to some other occupation.

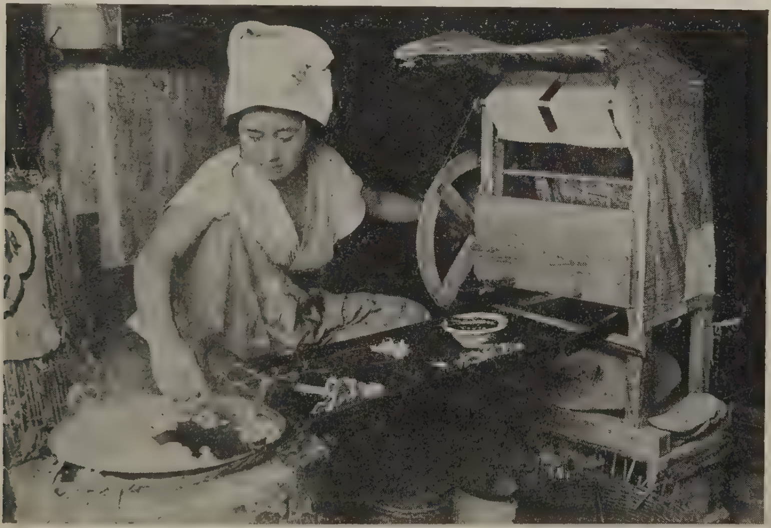

FIG. 36.—The primitive hand reel of feudal Japan is still used in the homes of the farmers for the production of raw silk. (*Photograph by H. Suito, Tokyo.*)

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[1] *Op. cit.;* Great Britian, *Parliamentary Papers*, LXVII, 1871, Report of Mr. Adams on Deterioration of Japanese Silk.

Aside from any deterioration in the quality of the raw silk through the export of the better eggs, the methods of reeling were also responsible for a poor and uneven product. Practically all of the reeling was carried on as a subsidiary industry in the homes of the farmers. In many cases, the work was done carelessly, and the silk was of a distinctly inferior quality. Even where the reeling was done conscientiously there could be no standardization of method or uniformity of product. The unevenness of the raw silk made it unsuitable for use in power looms. In the European and American markets, there was a great deal of dissatisfaction with regard to Japanese silk. Finally, the report reached Japan that many thousand bales of the silk were lying in London warehouses condemned because of its poor quality as useless for the weaving machinery of the English factories. It was realized that wide-sweeping reforms must be instituted at once if the Japanese industry was to survive. The movement toward improvement came from two sources—from a large private company and from the government.

In 1869, a silk exporting house, Ono-gumi by name, ordered from France a silk reeling machine of the latest design. The exporters had become concerned over the general dissatisfaction with Japanese silk in foreign markets, and had easily determined the cause of the poor quality, for one of their departments was engaged in the purchase of raw silk throughout all parts of Japan and was familiar with the careless conditions under which it was reeled. It was decided, accordingly, to establish a model filature in an effort to revolutionize reeling methods. The French machinery was installed in a factory in Kyobashi-Ku, the business section of Tokyo, and 100 reelers were employed. It is not probable that the influence of this filature was very widespread, for it was soon discovered that Tokyo was not a suitable location for a silk filature, and the machinery was moved to the village of Nihonmatsu in Fukushima Prefecture where cocoons were produced.

The Tomioka Filature

In its influence upon the industry, the effort of the government to bring about improvements was much more significant. In 1871, the government decided to establish a modern filature to serve as a school to train workers in the new methods. The services of Paul Breuner, a Frenchman, were secured and he came to Japan accompanied by a staff of French men and women. Tomioka, a village in Gumma Prefecture approximately 50 miles from Tokyo, was selected as the site of the new filature. It was selected for a number of reasons. The village was the center of an important silk district producing cocoons of good quality and also raw silk that already enjoyed a good reputation in Yokohama. Transportation was another consideration. The railroads from Tokyo to Yokohama and from Osaka to Kobe were nearing completion but throughout the remainder of Japan only the methods of transportation of the feudal days were available. Tomioka was in one of the silk districts nearest to Yokohama, and transport overland by pack-horse across the level Kwanto Plain with no intervening mountains was comparatively easy. It was also possible to travel by boat down the Tone River to its mouth and then by sea the short distance to Yokohama.

Breuner was accompanied not only by silk experts, but by mechanics, carpenters, a doctor, and a cook. His first task was the construction of a suitable building. Since he had always been accustomed to factories of brick, he proceeded, with little imagination, to erect a brick structure though it was first necessary to teach the Japanese the art of brick making and though the usual Japanese building of wood or of wood and plaster would have been almost as satisfactory for housing the filature. Few Japanese silk reelers have followed his example, for most of the modern filatures are in frame buildings. Breuner had brought with him only a few reeling machines to serve as models, but his mechanics constructed many more while the building was being erected. The filature opened in 1872 with 300 basins and 300 students. The machinery was driven by steam raised by the burning of coal.

Breuner remained in Japan only two years and by the end of three years all of the foreigners had returned to France. During their brief stay, more revolutionary mechanical changes were introduced into the Japanese silk industry than have been accomplished in the more than half a century that has followed their departure. The Japanese have accepted and applied successfully the methods introduced from France, but they have done little to improve upon them, perhaps because their contact with their teachers was for too limited a period to permit a thorough mastery of the fundamentals of the new mechanical system.

The Tomioka factory created something of a sensation. For many years it was a great curiosity, partly because of the new machines but probably even more because of the size of the building and the fact that it was the first building in Japan to be constructed of brick. Tomioka became the goal for pilgrimages by the country folk, and huge crowds gathered before the factory. Pictures of the building were hawked about to be carried back home as presents and souvenirs. The factory was visited in 1874 by the Empress and the Empress Dowager.

For 20 years, the filature continued as a government school from which workers were sent to all parts of Japan, many of them to start filatures on the new model. In 1892, the factory was purchased from the government by the Mitsui family, and about 1902 it passed to its present owners, the Hara family, exporters and wholesalers of raw silk.

The influence of the Tomioka school upon the Japanese silk industry has been considerable. Within a few years, many machine filatures were established especially in the neighboring prefecture of Nagano where the conditions for producing cocoons are even more favorable than in Gumma. The first was the Yamaju filature starting with 15 or 16 basins in 1873. The family had previously reeled silk in their own home with hand power reels and had depended mainly upon members of the family for labor though sometimes they had sent cocoons to the homes of other farmers for reeling. In the new filature, the power was provided at first by waterwheels. The venture was successful and expanded gradually. After 1902, branches were established, and in 1925 the family organization was replaced by a company. The Yamaju Company is today one of the best known in Japan, producing silk almost exclusively

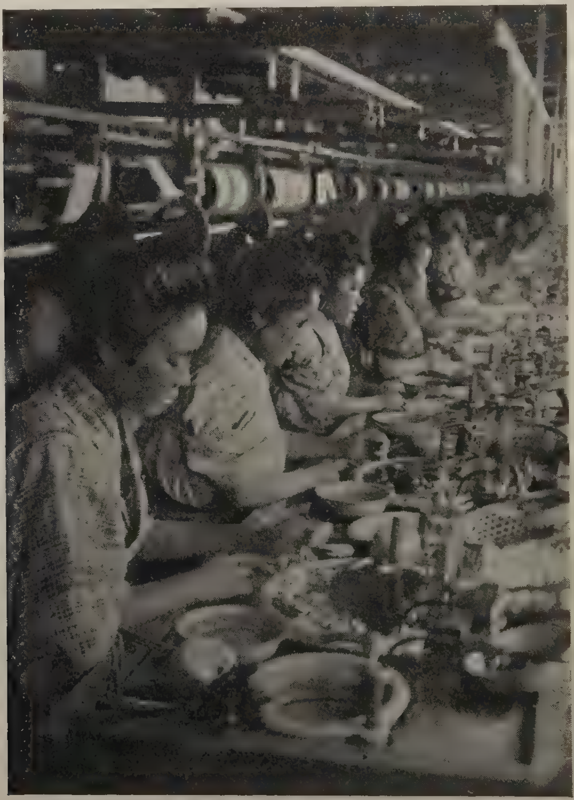

FIG. 37.—The modern method of reeling raw silk. (*Photograph by H. Suito, Tokyo.*)

for export. Other large filatures of the present day have had much the same history, originating with a domestic family industry and then

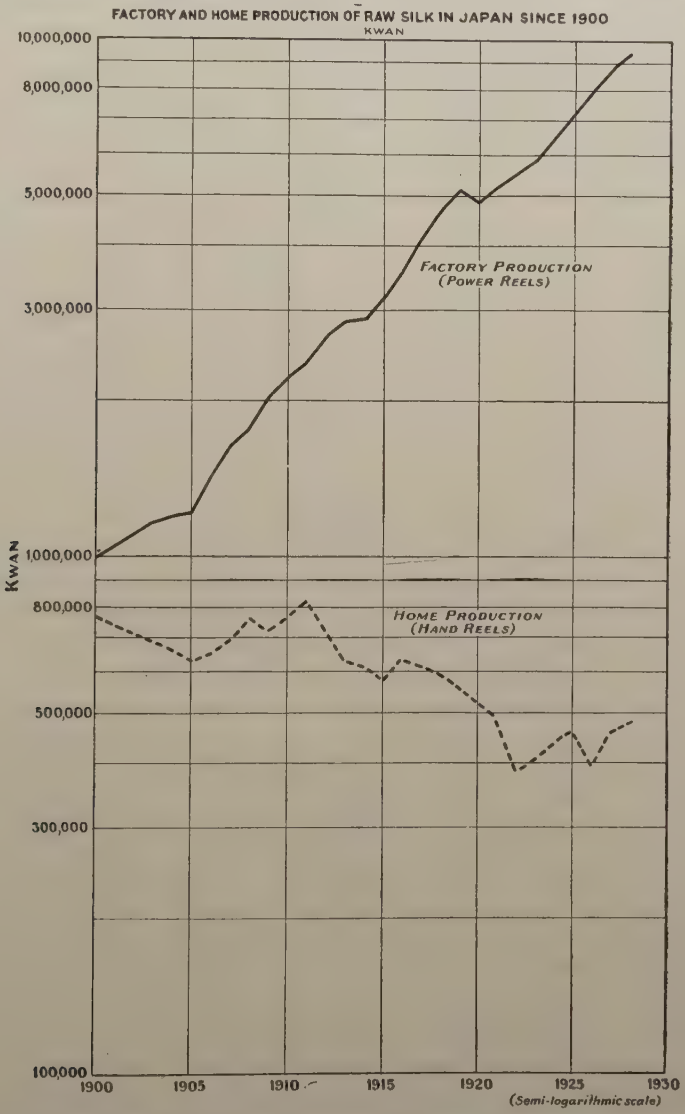

FIG. 38.—In the production of raw silk the factory is rapidly displacing the domestic industry, but some silk is still produced on hand reels. (One kwan equals 8.27 pounds.)[1]

from a small factory expanding into a large company with many branches.

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[1] Data from Statistical Reports of Department of Agriculture and Commerce, *op. cit.*, and Statistical Abstracts of Ministry of Agriculture and Forestry, *op. cit.*

At present, the greater part of the raw silk production comes from the filatures. In 1900, the first year for which separate statistics of factory- and home-reeled silk are available, 56 per cent of the total output was machine reeled and in 1928 about 95 per cent. The shift from hand-reeled to machine-reeled silk is shown graphically in Figure 38. It should be mentioned that though the hand-reeled silk is only a small part of the total production of the country at present, its value in 1928 was over $16,000,000.

The transition of the silk reeling from the home to the factory has to some degree accomplished the improvement in the quality of the product that was the primary motive back of the establishment of the first factories. The factory-reeled silk is of a higher quality than that reeled in the homes and commands a higher price. Most of it is exported and the home-reeled silk is consumed in Japan. The complaints with regard to quality have by no means ceased, however, and in 1927 a silk yarn commission was appointed by the Minister of Agriculture and Forestry to devise means of improving quality.

THE MINING INDUSTRY

Two outstanding landmarks in the modernization of Japanese mining were the use of explosives in the silver-gold mine on Sado Island by an English engineer in 1867 and the sinking of a modern shaft and the installation of the equipment to keep it dry at the Takashima colliery in 1868. Soon after the Restoration, the government began to take the lead in the development of mining. At one time, it operated eight metal mines and two collieries and employed 80 foreign mining experts. It took over the operation of the Takashima and Miike collieries in 1873 and opened the Yubari coal field in Hokkaido in 1883. Most of the government mines were operated at a loss, but through its model mines the government demonstrated the advantages of the new methods and attracted private enterprise into the industry. As in all other industries, the Japanese took over the management of the mines as rapidly as possible and by 1880 few of the foreign mining experts remained in the country. The development of mining has been restricted by the limited mineral resources of Japan, but good progress has been made in the mining of coal and copper. By 1890, the government was able to withdraw from its mining activities and leave the industry entirely to private enterprise.

THE IRON AND STEEL INDUSTRY

The iron and steel industry is not an industry of major importance in Japan but because of its vital significance in the industrial system and in any scheme of national defense, the efforts that have been made to westernize it deserve special consideration. To no other industry has the Japanese government given so much assistance and in no other industry has the assistance produced such meager results.

The iron industry of the feudal period, destroyed by the competition of the foreign iron, was not replaced at once by a modern industry. For its rehabilitation on western lines, the iron and steel industry demanded more complicated and expensive equipment and more technical skill than did the textile industries. It is dependent upon supplies of iron ore and fuel and since both the raw materials and the finished products are bulky, cheap transport is essential.

Writing in 1874, a visitor to Japan spoke of a furnace of European design that had been in operation in Kagoshima for several years, probably in connection with the arsenal of the Lord of Satsuma.[1] It is usual, however, to consider that the making of iron and steel by the modern method began in Japan with the erection of two furnaces of European design at the Kamaishi iron mine in Iwate Prefecture in 1873. Iwate Prefecture is located on the northeastern coast of the main island and contains the major portion of Japan's scanty reserve of iron ore. The deposit, according to tradition, was first discovered in 1720, but the date 1832 seems more authentic.[2] The ore is magnetite and the reserves were fairly satisfactory for the type of furnace used in feudal Japan. A small furnace was erected at the mine in 1849 by a Japanese after Dutch drawings. It was replaced 24 years later by the two European furnaces erected with the assistance of the lord of the district. The mine was purchased by the government in 1874 with the intention of developing for Japan an important iron and steel center. In Suzoka, a suburb of Kamaishi located on the coast about 12 or 15 miles from the iron mine, two furnaces of the latest design were erected with the assistance of British engineers, and a railroad was built connecting the mine and the harbor. The first iron was smelted in 1882, but soon many difficulties developed including a shortage of fuel. Charcoal was used, and as it became scarce unsuccessful attempts were made to manufacture coke from the local coal. The works were closed down in 1883. A private manufacturer, Chobei Tanaka, was fairly successful in making pig iron at the works on an experimental scale in 1885, and in 1887 he purchased the plant. It has remained in private hands until the present, at first under the Tanaka family, then under the Tanaka Mining Company, and finally in 1924 control passed to the Mitsui interests. It is now operated by the Kamaishi Mining Company, a

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[1] DR. GEERTZ, "Useful Minerals and Metallurgy of the Japanese," *Transactions Asiatic Society of Japan*, Vol. 3, Oct. 14, 1874.

[2] The Association of Japanese Mine Owners, Explanatory Notes on Mining in Japan, p. 82, 1926.

Mitsui subsidiary. It is one of the very few private iron and steel plants in Japan.

The Imperial Steel Works

The government was not satisfied with the small beginning made at Kamaishi and in 1892 an investigation committee was appointed by the Department of Agriculture and Commerce to devise means of freeing the country from its dependence upon foreign supplies of iron and steel. It was felt that it was a dangerous situation in which to remain if the naval and military expansion was to be at all effective. The committee apparently had little concept of the requirements of an iron and steel industry of any size, for after an investigation extending over three years it reported in most enthusiastic terms upon the prospects of Japan as a steel-producing country. Its final report dwelt upon the great extent of the iron ore deposits at Kamaishi, at several places in Hokkaido, and in Niigata Prefecture, referred to possible reserves in several other prefectures, and even mentioned the iron content of the copper ores of southern Honshiu, Shikoku, and Kyushu as a possible source of supply. The committee declared that Japan was as favorably situated as any country of Europe or America for the production of iron and steel.[1] Later developments have demonstrated that there was no foundation for so optimistic a report, but the government decided to undertake the construction of a huge iron and steel plant and the Imperial Steel Works was built at Yawata in northern Kyushu. It is not out of place to mention here that the plant gets very little of its ore from Japan but is operated on ores brought from other parts of Asia and even from Australia. The local fuel supply is not entirely satisfactory, for Chinese coal must be imported to mix with the Japanese coal for coking.

The first blast furnace of the government plant was completed in 1901, and in the same year the manufacture of steel began. The demand for steel was greatly increased during the war with Russia and it was necessary to expand the plant. Another period of expansion occurred during and immediately following the World War and a number of privately owned steel plants were built, none of which, however, has been successful financially. The Imperial Steel Works is still the most important factor in the iron and steel industry of Japan. It has about one-third of the blast furnace capacity and almost one-half of the steel making capacity of the country.

In recent years, there has been in Japan a growing feeling that the activity of the government in the iron and steel industry has had its disadvantages and that it has hampered the expansion of the industry,

[1] *Japan Weekly Mail*, Feb. 9, 1895.

since private capital has been reluctant to enter an industry in which it would come into competition with a government plant. A commission appointed by the Ministry of Agriculture and Commerce recommended in 1927 the ultimate withdrawal of the government from the iron and steel industry and the encouragement of private enterprise.[1] The participation of the government may have had all the bad effects now charged to it, but the fact remains that without the liberal use of government funds in the earlier period Japan probably would have no iron and steel industry today, for at the time of its establishment it labored under so many handicaps that it offered no attractions to private capital, even if such capital had been available.

THE PREPARATION OF TEA

Various other Japanese industries have undergone westernization to a greater or less degree. The tea industry as it exists today is largely a foreign industry organized by foreigners for the export of the product. At the time of the opening of the country, tea shared with raw silk the important place in the export trade of Japan, constituting approximately 23 per cent of the value of the total exports in 1868. Today, almost 50 per cent of the tea produced in Japan is grown in Shizuoka Prefecture and practically all of the export tea is from that district. Prior to the opening of the country, Shizuoka was of no especial significance in the cultivation of tea. It produced no more than did many other districts. Climate and topography were favorable for the tea plant, however, and in the prefecture is Shimoda, the first port in the eastern part of the country to be opened to trade. Production responded quickly to the foreign demand. In the decade ending with 1883, there was a fourfold increase in the value of tea land near Shizuoka City. The leaves were prepared, as they still are, in the homes of the farmers or in small factories located in the fields. The wholesalers and exporters found that the curing was not sufficiently careful to produce a tea of good quality and they were forced to refire, clean, and sort the leaves in their own factories. The raw tea continues to be produced in small establishments where methods have changed to the extent that machinery has been introduced even into the farm houses, but the leaves are still refired and packed for export in the larger factories of the wholesalers or exporters, located mainly in the city of Shizuoka. Most of the wholesalers are Japanese, but with one exception the exporters are all foreigners, chiefly American, who have their headquarters in their home country and who go to Japan only for the tea season. The industry is one that the Japanese have not succeeded in bringing under their control and processes have not been improved sufficiently to eliminate the necessity of refiring, an added expense that does not enter into the production costs in other tea-producing countries.

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[1] *Trans-Pacific, op. cit.,* May 14, 1927.

THE RUBBER INDUSTRY

Another group of industries was unknown in Japan before the modern period. In their case, westernization has meant the importation bodily of both the industries and the processes. Most of them have undergone few changes since they were brought in and illustrate the inability of the Japanese to adapt and develop upon the basis of foreign methods. The rubber industry, for example, was established in Kobe in 1897 by the Dunlop Company, a British concern. For a decade, the Dunlop factory was the only producer of rubber goods in Japan, but in 1907 a second factory was established by a partnership of a British engineer from the Dunlop factory and a German who furnished the capital. The venture did not succeed and, after being closed for several years, it was taken over by a Japanese. It is at present one of the largest rubber factories under Japanese control though in 1926 it employed only about 200 workers. Other Japanese rubber factories sprang up in 1916 and 1917 when a demand for rubber shoes was created by the high price of leather. All made use of technical skill that had been developed in the Dunlop factory.

THE MATCH INDUSTRY

The match industry is another imported industry. Before the opening of the country, flint and steel were used. The matches imported from Europe were too expensive for the poorer people. In 1872, a government official returned to Japan from France where he had been studying chemistry. He began experimenting in his home in Tokyo and after five years was able to establish the match industry—at first as a domestic industry. At the same time, experiments were being carried on in Kobe and Osaka with physicians supplying the chemical knowledge. Some degree of success had been attained by 1875, and the manufacture of matches as a household industry spread throughout Japan. A German machine was brought in in 1877, and the first factory was established. In the factories of the present day, the machinery is Swedish or German, or of Japanese construction upon Swedish or German models.

THE BREWING INDUSTRY

The brewing of sauces and liquors from soy beans and rice was one of the important food manufacturing industries of feudal Japan. It was a household industry and so unlike the modern brewing of beer that when the German experts designed and erected the first brewery in

1872, installing German machinery and equipment, they were establishing a new industry. They remained as teachers for about 10 years. The Japanese breweries resemble the German models as closely as did those of St. Louis or Milwaukee and their product is a close imitation of the more famous German beer. Some of the hops consumed are still imported from Germany and Czechoslovakia.

THE MAKING OF PAPER

The making of paper was introduced into Japan in 610 A.D. by a Korean priest. It became almost as important a subsidiary occupation of the farmers as the reeling of raw silk. It bore little resemblance to the modern paper-making industry either in process or in product. The paper was made from the inner bark of the paper mulberry tree and had its own peculiar properties which made it suitable for use in screens and the walls of houses and in the manufacture of umbrellas and lanterns. In 1873, Austrian and American teachers were brought in to establish the manufacture of paper in the foreign style and in the new factories Austrian and Swiss machinery chiefly was installed. Though the manufacture of Japanese paper is today of relatively little importance, the old and the new industry still exist side by side and are considered as quite distinct. In occupational and production statistics, it is usual to specify whether it is Japanese or foreign-style paper to which reference is made.

THE CHEMICAL INDUSTRY

The chemical industry is still another industry introduced recently. It received its greatest stimulation during the World War with the cutting off of supplies from Germany, especially of dyes and other coal-tar products. During the feudal period, vegetable and mineral dyes were used in the Japanese textile industry, and in the modern period there was a gradual change to the synthetic products. At the beginning of the World War, 85 to 90 per cent of the dyestuffs consumed in Japan were imported. Because of the war which made the new industry necessary, the logical teachers were not available, and the chemical industry was established by Japanese chemists, who had studied abroad, aided by American and Swiss chemists and by textbooks and periodicals. A number of small dye factories were established, equipped to manufacture only sulphur black or at most the more simple colors. Some were little more than household industries, and with the decline in prices at the end of the war they quickly disappeared. The only large private undertaking was the Miike Dyestuff Industry Works, established by the Mitsui interests at their Miike colliery. That plant manufactured 23 per cent of the total dyestuff output of the country in 1927 and 40 per cent of the high grade products.[1]

With government assistance, a large dyestuff plant, the Japan Dyestuff Manufacturing Company, was established in Osaka in 1915, equipped to manufacture an extensive list of the more complicated dyes. The government guarantees a return of 8 per cent on the capital invested in the plant and in addition offers a high bounty for the discovery of new dyes. Up to the end of 1927, the Osaka plant had received about $7,500,000 in subsidies and bounties.[2] It is the largest producer of dyestuffs in Japan. The industry has a high tariff protection, and in 1926 a gentlemen's agreement was entered into with Germany limiting the exports, from that country to Japan, to dyes not made in Japan.

The westernization of the other industries has proceeded along much the same lines as those already discussed though in no instance have the changes been so radical and so complete as in cotton spinning or in the making of iron and steel. The process of industrialization is by no means complete. In many industries, there has been scarcely any change from the methods and organization of the feudal period. The improvements in transportation at home and the contact with foreign countries have greatly expanded markets, but the increased demand has been met simply by the multiplication of the old processes and units. In the following chapters will be presented an analysis of the distribution of present-day industries in Japan and of the factors determining their location.

[1] *Trans-Pacific, op. cit.*, Feb. 28, 1929.

[2] *Op. cit.*, Feb. 11, 1928.

CHAPTER VII

PRINCIPAL MANUFACTURING INDUSTRIES

THE efforts of the past 75 years have borne fruit. Progress in industrialization has been made, and several important manufacturing industries have been established though it has been impossible to introduce many of the industries of the West even with the encouragement of government subsidies and the assistance of foreign experts. Feudal Japan is disappearing and agriculture is no longer the one occupation of the country.

MEASURES OF THE RELATIVE IMPORTANCE OF INDUSTRIES

To determine the principal industries and their relative importance is not a simple task. A number of indices are available no one of which by itself is wholly satisfactory or final. The industries may be ranked on the basis of the number of workers employed, the value of product, the power consumed, or the capital invested. The first index has the advantage of showing the importance of an industry in the number of people depending upon it for support, a significant consideration in a densely populated country, such as Japan, where there is need of providing employment for large numbers. It measures only the quantity of the labor, however, and not its skill or productivity. Two industries, employing the same number of workers, may be of quite unequal importance. The workers in one may be unskilled or employed as hand labor producing a small output; and the workers in the other may be highly skilled or able to make use of machinery. This objection has probably less weight in Japan than in countries more advanced industrially, for the factory workers are not highly skilled and from one industry to another there is a comparatively slight range in skill. The number of workers employed is probably the best single measure available of the relative importance of Japanese manufacturing industries.

The second possible index is the value of product. It has shortcomings that are easily apparent. As any material proceeds from one industry to another and with each process becomes more highly fabricated, its value is cumulative. The value of product of one of the final industries is necessarily relatively high because it has utilized as a raw material the already fabricated product of another industry. It is obviously unfair to compare the value of product of the spinning industry, which includes the cost of the raw cotton and the cost of spinning it into yarn, with the value of product of the weaving industry, which includes not only the cost of weaving the cloth and the value of the raw cotton, but also the cost of spinning the raw cotton into yarn and perhaps of bleaching and dyeing it. Despite its evident shortcomings, the value of product need not be entirely disregarded as an index, for in Japan the greater degree of industrialization has been in the industries using unfabricated raw materials.

The value added to a product by each particular manufacturing industry is an excellent measure since it represents only the contribution of each industry irrespective of the degree of fabrication of its raw material. Unfortunately, no such statistics are available for Japan, the only values reported being the total value of the product as it is turned out by each industry.

A third measure is the amount of capital invested in the different industries though it does not furnish an accurate basis for comparing industries like shipbuilding, demanding a large fixed plant and equipment, and industries like silk reeling, utilizing relatively simple and inexpensive machinery.

And, finally, statistics of horsepower consumed serve both as an index of the relative importance of the different industries and as a measure of the degree of their westernization. Power consumed cannot be a full measure of the importance of industries, for some industries, because of the nature of their processes, consume much power and others very little. Power consumed is a particularly unsatisfactory index of Japanese industries, since both silk reeling and cotton weaving, of whose importance there can be no question, require comparatively little power.

No other statistical measures of Japanese industries are available. Two of the four here considered, the number of workers employed and the horsepower consumed, are subject to a serious limitation. They include only the establishments with five or more workers and do not include the thousands of smaller workshops that constitute so important a section of the Japanese industry. A third, the amount of capital invested, includes only the capital invested in limited and unlimited partnerships and in joint-stock companies. All the many small individual enterprises are not reported upon. The data give undue importance to industries such as shipbuilding whose scale of operation is necessarily so large that it can be financed only by a corporate or partnership organization. They minimize the position of industries like the weaving of cloth carried on by individuals on a small scale with little or no outside assistance in financing. In 1928, there were in Japan 4,791 establishments weaving cloth and only 578 were of the type of financial organization required by law to make a report on the capital invested. The statistical data available serve as a measure of those industries that are carried on in factories rather than of Japanese manufacturing in general.

THE LEADING MANUFACTURING INDUSTRIES

In Table VI are presented the first 10 factory industries of Japan ranked by the number of workers employed, the value of product, the

TABLE VI.—IMPORTANT MANUFACTURING INDUSTRIES OF MODERN JAPAN

A. Persons engaged in industry[1]

Industry	Number of workers, average 1926–1928	Rank
Silk reeling	407,920	1
Cotton spinning	203,833	2
Cotton weaving	160,333	3
Shipbuilding	98,777	4
Brewing	88,383	5
Weaving of silk and silk-mixed cloth	87,249	6
Printing and bookbinding	63,198	7
Dyeing, bleaching and finishing	45,736	8
Weaving of wool and wool-mixed cloth	44,255	9
Manufacture of electrical machinery	42,008	10
Total	1,241,692	

B. Value of product[2]

Industry	Value of product, yen, 1924	Rank
Silk reeling	801,261,000	1
Cotton spinning	644,954,000	2
Cotton weaving	633,427,000	3
Brewing	539,868,000	4
Weaving of silk and silk-mixed cloth	289,058,000	5
Weaving of wool and wool-mixed cloth	193,926,000	6
Sugar refining	187,500,000	7
Paper and pulp manufacture	166,910,000	8
Printing and bookbinding	146,659,000	9
Manufacture of electrical machinery	146,121,000	10

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[1] Japan, Department of Commerce and Industry, Bureau of Statistics, Statistics of Department of Commerce and Industry, 1926, 1927, 1928. The 10 industries in the above table employed 60.3 per cent of the persons engaged in all Japanese industries employing more than five workers and exclusive of gas and electric plants in 1926, 59.5 per cent in 1927, and 59.4 per cent in 1928.

[2] Japan, Department of Commerce and Industry, Statistical Bureau, Statistical Report of Factories (in Japanese), 1924. The par value of the yen is $.498 gold.

TABLE VI.—IMPORTANT MANUFACTURING INDUSTRIES OF MODERN JAPAN—(*Continued*)

C. Power consumed[3]

Industry	Horsepower consumed, average 1926–1928	Rank
Refining and alloying of metals	367,068	1
Shipbuilding	341,072	2
Cotton spinning	341,040	3
Paper and pulp manufacture	224,658	4
Cement and lime	189,158	5
Cotton weaving	140,936	6
Manufacture of ingots, bars, rods, tubes, pipe and wires	113,692	7
Lumbering	95,766	8
Munitions manufacture	90,269	9
Manufacture of locomotives and cars	69,965	10
Total	1,973,624	

D. Capital invested[4]

Industry	Amount invested, yen, average 1926–1928	Rank
Cotton spinning	321,839,000	1
Brewing	282,447,000	2
Manufacture of electrical machinery	170,830,000	3
Shipbuilding	165,344,000	4
Paper and pulp manufacture	143,731,000	5
Silk reeling	129,224,000	6
Refining and alloying of metals	117,324,000	7
Weaving of wool and wool-mixed cloth	108,761,000	8
Cement and lime	107,238,000	9
Cotton weaving	95,878,000	10
Total	1,642,616,000	

power consumed, and the capital invested, all averaged for the years 1926 to 1928. The four lists include practically all the important manufacturing industries. The industries of the first list employ approximately 60 per cent of the factory workers of the country, the industries of the third list consume 67 per cent of the developed horsepower, and in the industries of the fourth list is invested about 54 per cent of the total capital reported invested in manufacturing. The remaining workers, horsepower, and capital are divided among hundreds of small industries.

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[3] Statistics of Department of Commerce and Industry, *op. cit.*, 1926, 1927, 1928. The first 10 industries consumed in 1926, 65 per cent of the total power consumed in Japanese industries employing more than five workers and exclusive of gas and electrical plants, in 1927, 67.7 per cent, and in 1928, 67.9 per cent.

[4] Statistics of Department of Commerce and Industry, *op. cit.*, 1926, 1927, 1928. In the 10 industries in the above table was invested 57.3 per cent of the total capital reported invested in Japanese manufacturing industries exclusive of gas and electrical plants in 1926, 52.2 per cent in 1927, and 52.5 per cent in 1928.

The agreement in the four lists is not particularly close, though the table of number of workers and the table of value of product are quite similar. These two indices probably provide the best basis for determining the principal industries. In the other two tables, the heavier industries that demand large amounts of invested capital and consume much power are emphasized. They also include certain industries that are considered essential to the country because of their importance in time of war and that are heavily subsidized for that reason. The capital invested may bear little relationship to the number of workers employed or to the value of the product.

THE TEXTILE INDUSTRIES

However inadequate and limited the standards of measurement are for particular Japanese industries, the determination of the group of industries of first importance is a simple matter. In modern industrial Japan, there can be no question of the preeminent position of the textile group, including the reeling of raw silk, the spinning of cotton yarn, the weaving of cotton cloth, the weaving of silk and mixed cloth, the spinning and weaving of wool, hemp, flax, and other fibers, and the finishing of cloth. It is in those industries that Japan has had the greatest development. They are industrial Japan.

The textile group employed 50 per cent of all the workers in Japanese factories in 1928, and in 1924, the latest year for which data are available, it contributed some 45 per cent of the total value of manufactured products. In that group of industries was invested, in 1928, 26 per cent of all the capital invested in limited and unlimited partnerships and in joint-stock companies engaged in manufacture, exclusive of concerns producing gas and electricity. In the same year, the textile industries consumed 24 per cent of the horsepower used in Japanese factories, and textile products constituted 68.7 per cent of the value of Japanese exports. The relatively low standing of the textile industries in power consumed and in capital invested in comparison with their high position in number of employees, value of product, and exports is explained by the character of their processes. They are all industries requiring relatively inexpensive plants and light machinery consuming little power.

If it were possible to consider statistically the thousands of smaller establishments not included in the factory reports, the textile industries would undoubtedly occupy even a more important position than is here accorded them. With the exception of the spinning of yarn, all the textile industries are still carried on throughout Japan in farm house and small workshop as well as in large factories. They provide the subsidiary occupations for farmers and villagers. The very great importance of textiles in the export trade is possible only because the products of those domestic industries supplement the output of the larger establishments.

The Reeling of Silk

The reeling of silk is the most important of the textile industries. It is also the foremost of all the Japanese industries. It employed in 1928, 20.6 per cent of all the workers in Japanese factories and in 1924 turned out about 12.5 per cent of the value of all manufactured products. Because of the relatively small amount of equipment necessary for a silk filature and its simplicity, the industry ranked only sixth in capital invested. In power consumed, it ranked far lower, for little power is required for turning the light reels. There can be no doubt, however, of the leading position of silk reeling. It is the only major industry for which adequate supplies of raw material are available within the country and throughout the entire modern period, it has supplied in the neighborhood of 40 per cent of the total exports of the country. In recent years, the value of the raw silk exported has been more than twice as great as the value of the next most important export.

Cotton Spinning

The Japanese industry of second importance is not so easily determined as the first. In the tables of number of workers and value of product, cotton spinning stands next to silk reeling. Since it is the most completely industrialized of all the Japanese industries, it outranks silk reeling in capital invested and in power consumed. Hand spinning has entirely disappeared and for economical operation large units are essential. In no other industry has there been so great a degree of concentration in factories. Factories call for an amount of capital usually beyond the capacity of the individual, and for that reason practically all of the spinning companies are at least partnerships and accordingly are reported in the statistics of capital invested. Many of the silk filatures, on the other hand, are small, individual enterprises and do not appear in the total of capital invested in silk reeling. Spinning machinery, though not to be compared with the machinery of an engineering shop, is heavier and requires more power for its operation than does a silk filature. Because of its extent, the industry even consumes as much power as the heavy industries—shipbuilding and the refining and alloying of metals.

Cotton Weaving

In a comparison of silk reeling and cotton spinning, more weight should probably be given to number of workers and value of product than to capital invested and power consumed, and silk reeling should be placed in first position and cotton spinning in second. Cotton weaving is a close third and may even be more important than cotton spinning. Since weaving is still carried on to a large extent in small establishments with two or three looms, many of them operated by hand, the government statistics are by no means an accurate measure of the strength of the industry. An estimate made for 1928, which attempted to include all weaving mills irrespective of size, placed the number of workers at 281,000, or 112,000 more than the number of operatives in the cotton spinning factories.[1] It should be stated, however, that though the spinning mill operatives are full-time workers, the weavers are often engaged in other occupations.

In capital invested and in power consumed, cotton weaving occupies a relatively unimportant position, as is to be expected with an industry conducted on so small a scale and with much machinery still operated by hand. In 1928, the number of looms per establishment averaged only 5, and of the 370,000 looms engaged in the making of cotton cloth, 99,000 were hand looms.[2]

THE OTHER MAJOR INDUSTRIES

Three industries, shipbuilding, brewing, and the weaving of silk and silk-mixed cloth, have a claim upon fourth place. They are so close that their positions shift from year to year. In number of workers employed, shipbuilding was fourth in 1926 to 1928, brewing fifth, and the weaving of silk cloth sixth. In value of product in 1924, brewing was fourth and silk weaving fifth. Shipbuilding was far down the list outside the first ten. In capital invested, brewing was outranked only by cotton spinning in 1926 to 1928, shipbuilding was in fourth place and silk weaving was not in the first ten. In power consumed, shipbuilding ranked second and brewing and silk weaving were not in the first ten. Both shipbuilding and brewing have become factory industries to a very large extent and are probably measured pretty accurately by the factory statistics. Silk weaving, like cotton weaving, is still a household industry, requiring little capital and consuming little power. The brewing industry includes not only the manufacture of alcoholic drinks, beer and sake, but also the brewing of the protein food products, shoyu and miso, made from the soy bean. In a country consuming a limited quantity of meat, it is an essential industry. In Japan, it certainly ranks as the leading factory industry in the preparation of food.

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[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

[2] *Op. cit.*

Shipbuilding is an industry requiring a large and expensive plant. Its machinery is heavy and much power is consumed in driving it. Many of the operations are still done by hand and the labor force must be large. In these respects—capital invested, power consumed, and labor—shipbuilding ranks high, but in value of product it is probably no higher than fourteenth or fifteenth in the list of Japanese industries. The explanation of the discrepancy is to be found in the heavy subsidies paid to the industry by the Japanese government. It has been considered an essential industry both for defense and for the promotion of trade. Money has been put into it beyond any expectation of profit and the value of the product has not had to be commensurate either with the labor employed or the capital invested.

It would be very difficult to rank with any degree of certainty the remaining important industries of Japan. To the first six—silk reeling, cotton spinning, cotton weaving, brewing, shipbuilding, and the weaving of silk and silk-mixed cloth—the manufacture of electrical machinery, printing and bookbinding, the weaving of wool and wool-mixed cloth, and the manufacture of paper and pulp should probably be added to make a list of ten.

The list of major industries suggests two very significant characteristics of Japanese manufacturing—the predominance of the textile industries already pointed out, and the subordinate position of the metals. Of the first ten industries, five are concerned with the preparation of cloth and its raw materials. Only two—shipbuilding and the manufacture of electrical machinery—are based upon the consumption of metals. One is government supported. In the other, the metal is utilized in a highly fabricated form. Primary metallurgy is not included though in the great manufacturing countries of the world, such as the United States, the United Kingdom and Germany, it is regarded as the basic industry. This industrial emphasis is not accidental or the result of a voluntary choice. It is the logical product of the resources at the command of the Japanese people. It will be analyzed at greater length in later chapters.

The absence from this list of a number of industries usually associated with Japanese manufacturing will be noted. There is no mention of the manufacture of matches, pottery, wooden and bamboo ware, mats, and lacquer ware. Some of these industries have attained undue prominence because of the wide distribution of their products in world trade. Japanese pottery and Japanese matches, for example, are well known, yet neither industry is of any considerable importance in Japan. Other industries have gained attention because of the unusual character of their wares. Such is the case with the lacquer industry. Still other industries do not appear in the list because they are largely household industries for which no accurate measure is available. For example, according to one estimate, the wooden-ware industry employed in 1928, 189,000 workers, or more than any of the major factory industries with the exception of silk reeling. In the same year, it was estimated that 120,000 workers were employed in the making of mats and matting.[1] Neither the making of mats or of wooden ware is a factory industry. In the discussion of the distribution of the manufacturing industries through the industrial areas of Japan in the following chapters, the household industries and the industries of minor importance will be included.

[1] *Op. cit.*

CHAPTER VIII

THE INDUSTRIAL DISTRICTS: THE RAW SILK AREA

MODERN industry demands large supplies of raw materials, power, labor, and a wide market and it tends to concentrate in localities easily accessible to those things. The concentration of industry was one of the principal developments of the European Industrial Revolution and in Japan the progress in industrialization has been accompanied by a considerable degree of centralization though industries are still pretty widely distributed.

Two major industrial areas may be distinguished. The one is the area producing raw silk situated in the mountainous core of Honshiu, the main island. The other is the peripheral strip stretching along the southern shore of Honshiu from Tokyo westward some 680 miles to the Straits of Shimonoseki and including the northern edges of the islands of Shikoku and Kyushu. In these two areas are to be found practically all of the major manufacturing centers of Japan and most of the modern industrial development. They are quite different in the character of their industries and in the factors that have governed their growth.

THE CONCENTRATION OF SILK REELING

The reeling of raw silk is an industry found in every one of the 47 prefectures of Japan. It is even carried on in the cold northern island of Hokkaido. In many of the prefectures, however, the industry is of little importance. Silk production is concentrated in the seven prefectures—Nagano, Gifu, Gumma, Saitama, Yamanashi, Fukushima, and Yamagata—here designated as the raw silk area (see Figure 39). Within their borders are 53 per cent of the workers in filatures and 53 per cent of the reeling basins, and in 1926, they produced, by value, 53.2 per cent of the raw silk output of Japan.[1] The remaining production is divided among the other 40 prefectures and in general the more remote the location of a prefecture from this area the less significant is its silk industry. The seven prefectures serve as a center of dispersion and in all directions, north, east, south, and west, the silk industry gradually declines in importance.

One other prefecture, Aichi, adjacent to Gifu and Nagano on the south, might perhaps be included in the raw silk area. Aichi is an

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[1] Japan, Department of Agriculture and Forestry, Statistics of the Silk Industry (in Japanese), 1926.

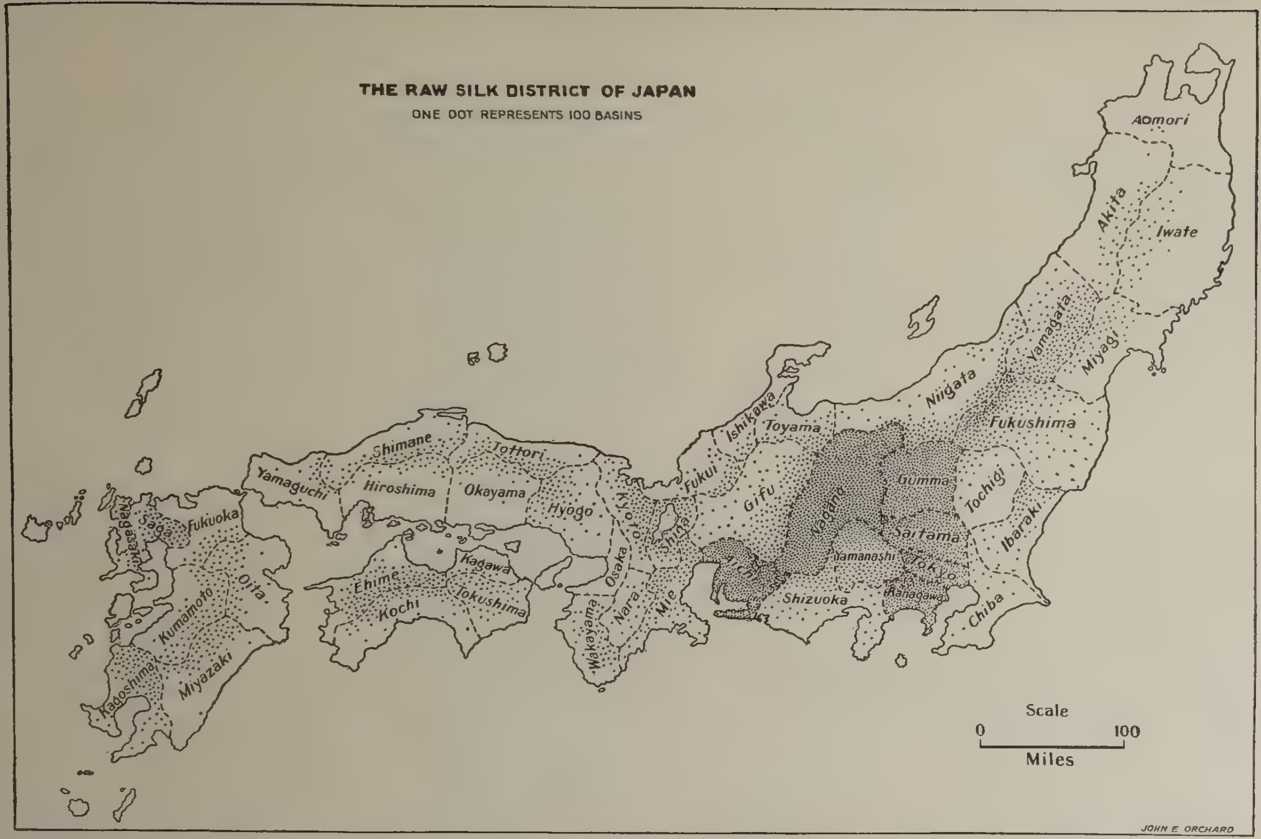
THE RAW SILK DISTRICT OF JAPAN
ONE DOT REPRESENTS 100 BASINS
Aomori
Akita
Iwate
Yamagata
Miyagi
Niigata
Fukushima
Toyama
Ishikawa
Fukui
Gifu
Nagano
Gumma
Tochigi
Ibaraki
Saitama
Yamanashi
Tokyo
Kanagawa
Chiba
Shizuoka
Aichi
Shiga
Kyoto
Osaka
Nara
Mie
Wakayama
Hyogo
Okayama
Tottori
Shimane
Hiroshima
Yamaguchi
Kagawa
Tokushima
Ehime
Kochi
Fukuoka
Saga
Nagasaki
Oita
Kumamoto
Miyazaki
Kagoshima
Scale
0
100
Miles
JOHN E. ORCHARD

FIG. 39.—The silk reeling basins are concentrated in the mountainous prefectures of Honshiu with Nagano as the center. (Data from Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1926.)

important silk producer, ranking second only to Nagano. In 1926, it produced almost 9 per cent of the raw silk output of Japan and employed 8.4 per cent of the silk workers. Aichi has been included in the present discussion, however, in the southern industrial area rather than in the raw silk area because the prefecture possesses a great variety of industries, several of them more important than silk reeling, and because in its development it resembles the coastal prefectures much more closely than it does the mountainous prefectures of the silk area. The same is true of Tokyo and Kanagawa.

The raw silk area differs from the southern industrial area in a number of respects. In the first place, the population is to a much greater degree rural in the silk area than in the industrial area, and agriculture is relatively a much more important occupation. In 1925, the urban population[1] in the silk prefectures ranged from 22.4 per cent in Nagano Prefecture to only 13.2 per cent in Yamanashi. In the industrial prefecture of Osaka, 76.5 per cent of the population was urban and in Tokyo, 88.5 per cent.[2] In the silk prefectures, in the same year, the households engaged in agriculture ranged from 53 per cent of the total in Fukushima Prefecture to 67 per cent in Yamanashi Prefecture; but in Tokyo Prefecture only 6.4 per cent, and in Osaka Prefecture 12.6 per cent of the households were in agriculture.[3] The silk district still remains predominantly an agricultural area. The reeling of raw silk is merely a necessary manufacturing operation attached to one of its most important agricultural activities and not necessitating a concentration of population in large cities. In the southern industrial area, manufacturing is much more completely divorced from agriculture.

The raw silk area is an area of a single industry, as 67 per cent of its factory workers are engaged in the reeling of silk. In Nagano Prefecture, 92 per cent and in Yamanashi, 90 per cent of the factory workers are in silk filatures. The percentage is lowest in Gifu, and even there it is 29 per cent of the total. The few other industries are of minor importance and are limited to the brewing of sake, the milling of grain, and the weaving of cloth. In the part of Gifu Prefecture contiguous to the Nagoya industrial center, there is a greater variety of industries, the most important of which is cotton spinning.[4]

The raw silk area also differs from the southern industrial area in accessibility. Probably the most important advantage of the southern industrial area is its excellent transportation facilities. It is on the sea and also in close contact by land with the major population centers of Japan. The raw silk area is anything but accessible. It is in the most remote part of the main island away from the sea and in the midst of rugged mountains rendering land transport difficult. For most manufacturing industries, accessibility is essential, but raw silk is light, compact and highly valuable and in its marketing costs, freight charges are not a vital element. Remoteness is no handicap. Many of the silk filatures are located in narrow, steep-sided valleys tapped at present by a single railroad winding a tortuous way along the stream course. Sometimes the valuable silk may be carried to the railroad or to the market center over mountain roads by truck, pack horse, or even by a cart drawn by man. One filature near Nagoya, visited in 1926, still used horse and cart to carry its product 4 miles to the railroad, and prior to 1889, before the Tokaido Railway line was completed, the journey was 15 or 20 miles.

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[1] Living in communities of 10,000 or over.

[2] Japan, Bureau of Statistics of the Imperial Cabinet, Report of Census (in Japanese), 1925.

[3] Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1925; Résumé Statistique, *op. cit.*, 1928.

[4] Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

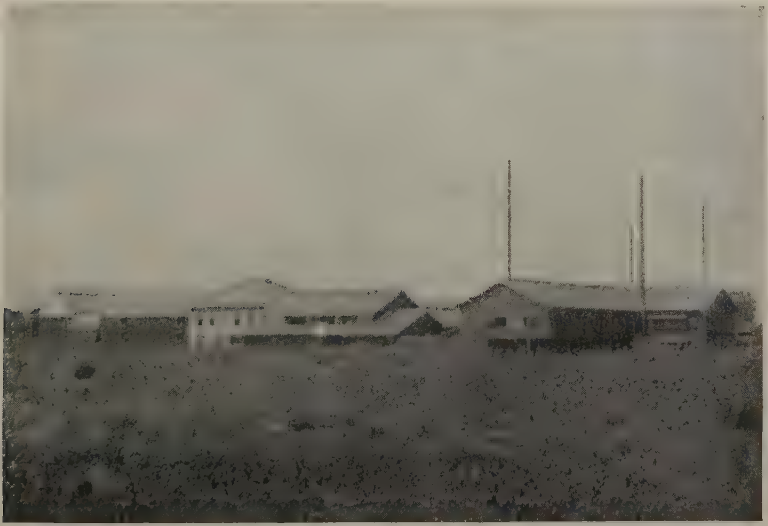

FIG. 40.—The raw silk filature is often situated in a rural district in the midst of mulberry fields and near the producers of cocoons.

FACTORS LOCATING THE RAW SILK INDUSTRY

Though the finished product is light, transportation has entered to some extent into the location of the reeling industry. The raw material, the cocoon, is also light, but it is bulky and somewhat perishable. The transportation of cocoons presents some difficulties, especially where facilities are limited; and the tendency has been for the reeling to be done as near as possible to the area of production of the cocoons even though such areas may be difficult of access. In the earlier years of the industry, the production of cocoons very largely determined the location of the silk reeling centers. There was little transport of cocoons from prefecture to prefecture. In 1890, for example, Nagano produced 21 per cent of the raw silk and 16 per cent of the cocoons and the seven prefectures of the silk district produced 61 per cent of the raw silk and 58 per cent of the cocoons.[1] The district was almost completely self-supporting for its supply of raw materials.

In more recent years, the silk area has not produced all of its raw materials. With the improvements in transportation and in methods of preserving the cocoons, there has been a considerable movement of cocoons from one district to another. The seven prefectures produced 52 per cent of the silk output in 1926 and only 39 per cent of the total cocoon output. Nagano Prefecture produced 25 per cent of the raw silk of the country and only 12 per cent of the cocoons.[2] Of the 80,000,000 pounds of cocoons consumed in Suwa, the most important silk reeling center of all Japan, only 5,500,000 pounds were produced in the neighborhood. One large filature in the village of Okaya, Nagano Prefecture, obtained most of its cocoons from other prefectures, and a second filature obtained 80 per cent from the outside. A large wholesaler in Okaya stated that he purchased not more than 30 per cent of the cocoons he handled in Nagano Prefecture and only about 20 per cent in the immediate neighborhood.

The increased production of raw silk with the growth of foreign trade has been accomplished largely by the expansion of the industry within the old established centers and not by the development of new reeling districts. Though the demand for cocoons has increased far beyond the productive capacity of the adjacent areas, the improvements in transportation have made it possible to bring the additional requirements from more distant sections. The spread of the industry has been a spread of cocoon production rather than of silk reeling. The early centers have retained their importance through industrial inertia, though it would probably have been more economical and efficient if silk reeling had followed the cocoons. The silk producing area of Japan is located more by the factors responsible for the location of cocoon production during the earlier years of the factory industry than by any forces functioning today.

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[1] Statistical Report of Department of Agriculture and Commerce (in Japanese), *op. cit.*, 1890.

[2] Statistics of the Silk Industry, (in Japanese), *op. cit.*, 1926.

The Rearing of Cocoons

The production of cocoons is governed by the presence of conditions suitable for the production of both the mulberry and the silkworm. Some of the conditions are positive. Others might be termed negative. In general, the cultivation of the mulberry is confined to land that cannot be used readily for the production of food crops. The great pressure of population decrees that food shall be the first consideration. It is on the steep slopes too rugged for rice that most of the mulberry is grown and it is the mountainous prefectures that are the important silk producers.

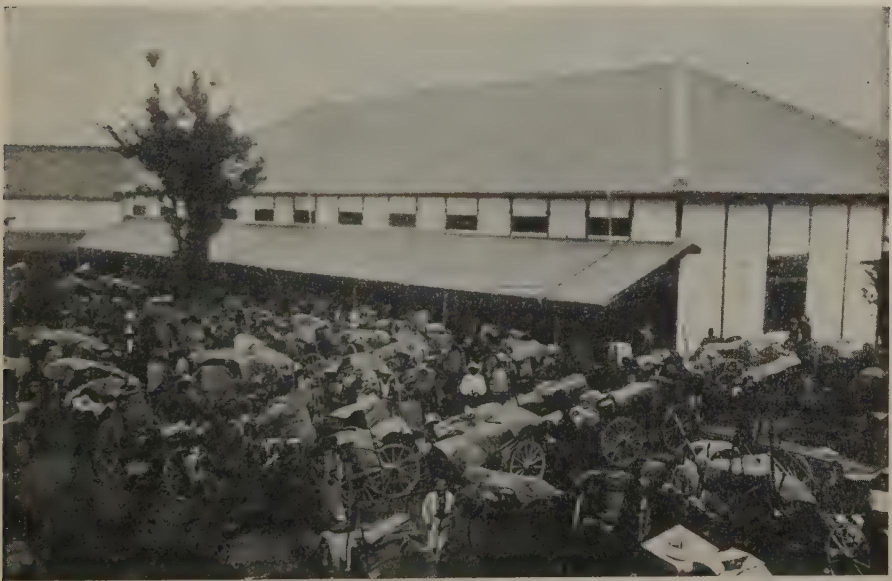

FIG. 41.—A cocoon market for the farmers in the Okaya silk district. The local markets have declined in importance with the improvements in transportation. (*Courtesy of the Yamaju Filature.*)

Topography and Soil

In the Japanese islands, two principal mountain ranges may be distinguished, the one originating in Sakhalin and extending southward through Hokkaido into Honshiu, the other originating in Formosa and running northward through the Lu Chu Islands, Kyushu, and Shikoku into Honshiu. In central Honshiu, the two ranges meet forming an extremely complex, irregular, and rugged mountain mass. It is in this area that the seven prefectures comprising the silk district are located. With the exception of Saitama and Gumma, they all possess a much smaller percentage of arable land than the average for the entire country (see Figure 7). The percentage for the two prefectures is relatively high due to the fact that they extend out from the mountain core upon the level Tokyo plain. The mulberry is largely confined to the mountainous sections of the prefectures, but along some of the river courses on the plains, gravels and sands have been deposited forming a soil much too porous for the flooding so necessary in the cultivation of rice. On such lands, especially on the flood plains of the Arakawa, the mulberry is also grown. There is a similar soil formation in Yamanashi Prefecture, and mulberry is grown on the flat lands along the river near Kofu.

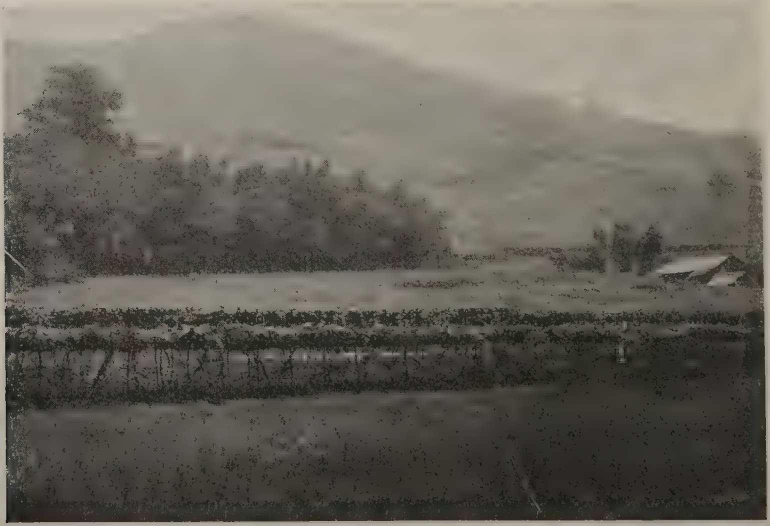

FIG. 42.—A canopy of grape vines spreads far up the slopes above Kofu, occupying a type of land that is usually given over to the mulberry.

The mulberry is grown for the most part on land that is too rugged, too porous, or too dry for rice. It cannot possess such land, however, without some competition with other dry land crops, especially barley, wheat, or grapes. The mountain slopes surrounding Kofu, where one would expect to find the mulberry, are covered with grape vines, partly because of the warm temperatures and partly because of the more or less accidental introduction of the vine by a resident of Kofu who traveled in America in the early years of the modern period. The mulberry is often to be seen growing along the borders and pathways of rice fields, and thus land is utilized that would otherwise be unproductive.

The mulberry and the silkworm have not always been confined to the mountainous sections of the country. In the eighth century, the finest raw silk was produced in the southern and southwestern parts of Honshiu in districts with extensive areas of coastal plain. The mountainous interior of the island was of no significance in the industry.[1] It has been suggested that silk production was forced from the southern area by the cultivation of cotton first introduced into Japan at the end of the eighth century. Since cotton quickly disappeared as a crop and was not reintroduced until the sixteenth century, it seems more probable that the mulberry was gradually pushed back into the mountains by the increasing density of the population and by the use of the land for rice.

The mulberry is an accommodating crop, but it does make some positive demands. Not all of the land unsuited for annual crops can be put into mulberry. The soil cannot be too sterile. Indeed, there is a close relationship between soil fertility and the quality and the yield of leaves. At the government experiment station in Nagano City, experiments with different kinds of fertilizers are now being conducted in an effort to produce superior plants.

Climate

The mulberry plant is hardy and is able to withstand the rigorous winters of the mountain districts. It grows even in Hokkaido, the north island, but a moderately long growing season is desirable. Otherwise there will be a curtailment of the number of crops of silkworms that can be raised during the summer. In Hokkaido, for example, only the spring crop is important. In 1926, the spring crop amounted to 560,000 pounds and the combined summer and autumn crops to only 38,000 pounds. In Central Honshiu, where the seasons are longer, the combined summer and autumn crops exceeded the spring crop by about 20 per cent.[2]

Though the mulberry does not demand the very heavy rainfall required by rice, fairly abundant moisture is necessary for a luxuriant growth of tender leaves. The summer maximum of rainfall common to practically all of Japan is especially favorable.

The silkworm seems to thrive best in very much the same sort of climate that is required for the production of its food. Though the worms are raised within the cottages of the farmers where it is possible to regulate the temperature and humidity to some extent, the houses are not particularly substantial in construction, and the outside atmospheric conditions are the vital control. The colder temperatures of the northern regions add to the difficulties of rearing the worms.

[1] Japan, Department of Agriculture and Commerce, Descriptive Notes on the Silks and Cocoons Exhibited in the World's Columbian Exposition, 1893, pp. 2–3.

[2] Japan, Department of Agriculture and Forestry, Statistics of Cocoons (in Japanese), 1926.

According to the secretary of the Nagano Prefecture Federation of Raw Silk Trade Associations, a dry climate is desirable for storing the cocoons throughout the winter. This requirement perhaps accounts for the relatively small production of cocoons in the mountainous prefectures of southern Japan. At Numazu in Shizuoka Prefecture, the average rainfall for the six months from October to March is 690 millimeters (27.3 inches) as compared with only 390 millimeters (15.4 inches) for the same period at Matsumoto in the silk district.[1]

Labor

A final and very important requirement in the production of raw silk is an abundance of cheap labor. The great density of population in Japan gives that country a decided advantage over Occidental nations. Many localities—South Carolina, Georgia, South Africa, eastern Australia, southern Brazil—have climates similar to the climate of Japan and quite suitable for the cultivation of the mulberry. Their resources are comparatively rich, however, and their numbers are scanty. There is no necessity for the population entering upon an occupation that offers so small a return as does the silk industry.

It is the rearing of the cocoons rather than the reeling of the silk that demands the cheap labor. Practically the entire cocoon output of Japan is produced as a subsidiary occupation of the farmer. Anything that may be received for the cocoons above the cost of the egg sheets and the rent of the mulberry land is considered as profit. The labor of the farmer's wife and children in the painstaking care of the worms night and day and the inconvenience of turning over the home to their production are not included in the costs. It is peculiar that this industry, turning out an article of luxury, should be a parasitic industry dependent upon unpaid or underpaid labor from the production of the raw materials in Japan to the final weaving of the cloth in American centers where the women and children of miners or steel workers are used in the mills.

In Japan, it is not necessarily in the prefectures of greatest density of population that labor conditions are most favorable to cocoon production. It is rather in the prefectures of greatest density in proportion to the available occupations for labor. On the plains, agriculture with its wide range of crops offers employment, or there is demand for labor in the factory industries which are located mostly on the level areas. The farmers are not forced to undertake the very exacting labor involved in the rearing of cocoons. In the mountain areas, there is less choice. Arable land is scarce, and difficulties of transportation discourage the development of manufacturing. The population must concentrate in the few possible economic activities even though those activities offer little return. This same limitation of opportunity, in the earlier years of the industry at least, directed the labor into the reeling of the silk, at first in the homes and later in the filatures.

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[1] Japan, Central Meteorological Observatory, Climate Data (in Japanese), pp. 26–27, 1924.

Thus a variety of circumstances seems to have conspired to concentrate the silk industry in the mountainous districts of Japan. There the rugged land can be used for little else, climatic conditions are favorable for both mulberry and silkworm, the difficulties of transportation make necessary a highly valuable and compact product, and the poverty of resource and opportunity makes available the necessary labor supply.

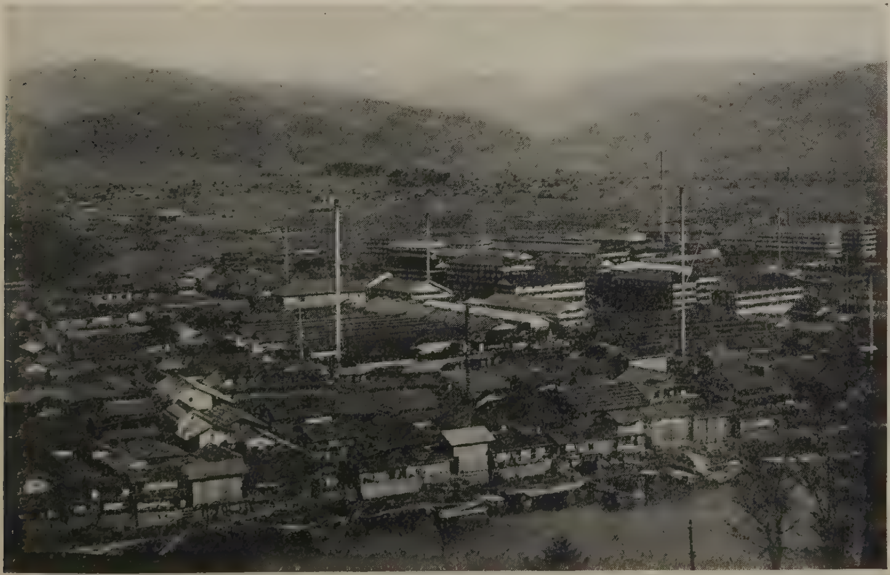

FIG. 43.—Silk filatures in Suwa, the leading silk producing district of Japan, showing the small size of the factories. The mulberry covers the lower slopes of the surrounding mountains. (*Courtesy of the Yamaju Filature.*)

THE SUWA DISTRICT

In the location of specific reeling centers within the cocoon producing areas, a number of factors have functioned. The Suwa district of Nagano Prefecture may be taken as an example. It is easily the most important single silk reeling center of Japan. It produced 36 per cent of the raw silk output of Nagano Prefecture in 1925 and over 9 per cent of the output of the entire country. Within its filatures were over 42 per cent of the basins of the prefecture and almost one-tenth of the total of Japan.[1] The Suwa district is situated near the center of the prefecture and is almost encircled by mountains. To the west is the high range of the Japanese Alps. To the east is the string of volcanic peaks finally terminating to the south in Fujiyama. Easy access to the district is possible only by way of the four narrow valleys carved by streams—the Shinano to the north, the Fujikawa to the southeast, the Tenryu to the south, and the Kiso to the southwest. Until railroads were built, this was one of the most isolated sections of Japan. It is now connected by rail with Tokyo, Nagoya, and the west coast of Honshiu. On the lower slopes of the mountains, the mulberry is grown and the silkworms are reared. The mountains also serve to keep out excessive moisture, apparently detrimental alike to the silkworms and to the cocoons in storage. In Table VII is given the average monthly rainfall of Matsumoto, not in the Suwa district but nearby and similarly protected, of Mito on the east coast of Honshiu and of Fukui on the west coast, all three stations being at about the same latitude. Mito has over 30 per cent more rain than Matsumoto and Fukui has more than twice as much. The Japanese Alps to the west are specially effective in shutting out the heavy winter rains that are brought to Fukui and to the west coast by the winds sweeping across the Japan Sea out of the high pressure area of central Asia.

TABLE VII.—EFFECT OF MOUNTAINS ON AVERAGE MONTHLY RAINFALL[1]
(In millimeters)

	Fukui (West coast)	Matsumoto (Central Japan)	Mito (East coast)
January	288.5	48.6	57.2
February	202.7	50.8	75.0
March	163.7	79.7	114.8
April	148.0	91.0	140.0
May	141.9	100.0	153.2
June	188.2	160.5	155.0
July	200.2	131.7	146.3
August	146.6	117.5	142.5
September	232.1	168.8	214.0
October	171.9	115.6	181.2
November	217.8	52.3	91.8
December	340.0	42.5	55.6
Total	2441.6	1159.1	1526.6

[1] Climate Data, *op. cit.*, Table XIII.

Most of the filatures of the Suwa district are located on the shores of Lake Suwa, a body of water with an area of about 12 square miles. It is only around its circumference that sufficient level land for the rambling one-story buildings can be found and the lake also supplies the large quantity of water required in the reeling of the silk.

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[1] Data from the secretary of the Nagano-Ken Suwa-Gun Kito Dogyo Kumiai (Nagano Prefecture Suwa County Raw Silk Trade Association).

Water power was first used when the industry was transferred from the home to the factory. It is for that reason that the greatest concentration of filatures is in the village of Okaya where the Tenryu River leaves the lake. Though the importance of water power has declined somewhat in later years, it is certain that its use in the industry will increase with the present large hydroelectric developments of the Suwa district.

A number of officials in the silk trade have expressed the opinion that the industry is moving westward toward Kyushu, but it is difficult to secure statistical evidence of such a movement. Though the rearing of cocoons is becoming more widespread with the increasing export of raw silk, there has been but little shift in silk reeling. The seven prefectures of the silk district produced 61 per cent of the country's output of raw silk in 1890 and 52 per cent in 1926. Nagano Prefecture, the heart of the district, has even increased in relative importance with 21 per cent of the output in 1890 and 25 per cent in 1926. Even if the trend westward should become pronounced, it seems certain that for an indefinite period, the seven prefectures—Gifu, Nagano, Gumma, Saitama, Yamanashi, Fukushima, and Yamagata—will remain the center of the raw silk producing industry. Physically, they are well suited to the rearing of cocoons and the reeling of silk, and in such a rugged district no other industry could be so profitable or employ so large a part of the population.

CHAPTER IX

THE OSAKA-KOBE-KYOTO INDUSTRIAL CENTER

THE other industrial area, the coastal strip extending from Tokyo to Nagasaki, completely overshadows the raw silk area in variety of industries, in number of factory workers, and in value of product. In the 16 prefectures included within the area are employed about 60 per cent of the Japanese factory workers. The area produces about 71 per cent of the annual total value of Japanese manufactured goods[1] and has 85 per cent of the cotton spindles.[2] It is the urban section of Japan, as is well shown in Figure 44. Within it are included 273 of the 609 urban communities[3] and 65.2 per cent of the people living in such communities. In the more highly industrialized prefectures of the area, the percentage of urban population ranges from 42.5 per cent in Hyogo to 88.5 per cent in Tokyo, in contrast with an urban population of only 36.6 per cent for all of Japan and of 22.4 per cent in Nagano Prefecture, one of the prefectures of the raw silk area.[4]

THE IMPORTANCE OF TRANSPORTATION

The principal advantage of the area for the development of manufacturing, and the one advantage common to all parts of it, is accessibility. It is the most accessible section of all Japan. Contact with other parts of the country or with foreign countries is easy. The Tokyo-Nagasaki strip lies along the coast within reach of the ocean or of one of its numerous inland seas or bays. The many indentations and islands afford excellent protection for shipping.

The advantages of the area were important even during Japan's period of isolation. Within it were concentrated most of the people of the country and it included the four important cities of Tokyo, Kyoto, Osaka, and Nagasaki. With the opening of Japan to the rest of the world, it was natural that the resulting trade should be concentrated along this coastal strip. There was an almost immediate increase in population. The old cities grew rapidly in size, and new ones, such as

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[1] Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

[2] Estimated from data in Japan Cotton Spinners' Association (Dai Nippon Boseki Rengokai), Semiannual Report (in Japanese), Dec. 31, 1928.

[3] Communities with a population of 10,000 or over.

[4] Report of Census (in Japanese), *op. cit.*, 1925.

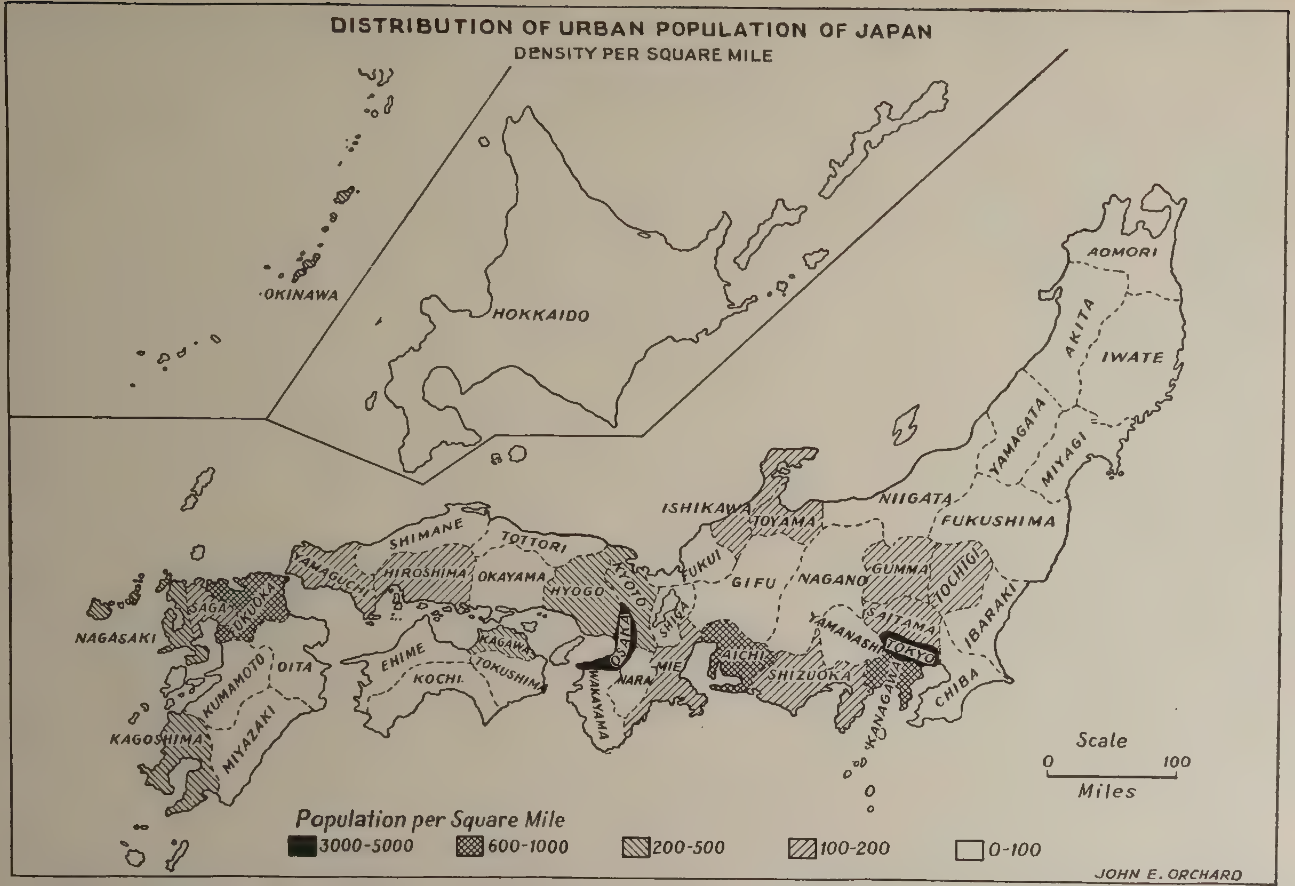
DISTRIBUTION OF URBAN POPULATION OF JAPAN
DENSITY PER SQUARE MILE
OKINAWA
HOKKAIDO
AOMORI
AKITA
IWATE
YAMAGATA
MIYAGI
NIIGATA
FUKUSHIMA
ISHIKAWA
TOYAMA
FUKUI
GIFU
NAGANO
GUMMA
TOCHIGI
IBARAKI
SAITAMA
YAMANASHI
TOKYO
CHIBA
KANAGAWA
SHIZUOKA
AICHI
MIE
SHIGA
KYOTO
OSAKA
NARA
WAKAYAMA
HYOGO
OKAYAMA
TOTTORI
SHIMANE
HIROSHIMA
YAMAGUCHI
KAGAWA
TOKUSHIMA
EHIME
KOCHI
FUKUOKA
SAGA
NAGASAKI
OITA
KUMAMOTO
MIYAZAKI
KAGOSHIMA
Scale
0
100
Miles
Population per Square Mile
■ 3000-5000
▦ 600-1000
▨ 200-500
▨ 100-200
☐ 0-100
JOHN E. ORCHARD

FIG. 44.—The greatest concentration of population in urban centers is in the industrial area. (Data from Report of the Census (in Japanese), *op. cit.*, 1925.)

Kobe and Yokohama, were established. The accessibility of the area permitted the import of raw materials and the ready disposal of the finished products of industry. It was in the Tokyo-Nagasaki strip that industrialization was first attempted and it is there that industrialization has attained its most notable success.

When Japan began to build railroads, a man-made advantage was added to the natural advantages already possessed by the Tokyo-Nagasaki area. Just as the concentration of population at Chicago at the south end of Lake Michigan attracted the railroads when the American West was being opened up, so the many centers of population in this area determined the routes of the earliest Japanese railways. From Tokyo to Kobe was built the Tokaido line. It was continued as the Sanyo line to Shimonoseki where it connects by ferry with the railways of Kyushu. Other railways were built later running northward into the interior of Honshiu.

Manufacturing development is not distributed evenly throughout the Tokyo-Nagasaki area. Some sections stand out as much more important than others. They are sections possessing advantages beyond the advantage of accessibility enjoyed by the entire strip. Some, because of deep harbors, have superior facilities for ocean transportation. Others have areas of extensive plains affording the opportunity for the expansion of cities and of industrial establishments. One or two sections are endowed with a supply of fuel or of raw materials. Such advantages—harbors, level land, raw materials—give to the localities possessing them a high degree of nodality and bring about a concentration of manufacturing industries. In the Tokyo-Nagasaki strip, four nodal points, each a major manufacturing center, may be distinguished. They are the Osaka-Kobe-Kyoto area, the Tokyo-Yokohama area, the Nagoya area, and the northern Kyushu area. Connecting and linking them into one great manufacturing area are industrial districts of less importance though more highly industrialized than the remainder of the country. Of the four major manufacturing areas, the most important is the Osaka-Kobe-Kyoto area, comprising the prefectures of Osaka, Hyogo, Kyoto, and Wakayama. Within its borders are included 25 per cent of the factory workers of Japan and 38.4 per cent of the cotton spindles. In 1924, the area produced 32 per cent of the total value of manufactured goods of the country. No other manufacturing area includes even one-half as many workers. The great growth of this area has resulted from its ability to take full advantage of the accessibility of its position. It borders the sea, it has two fine harbors—the one at Kobe and the other at Osaka, it occupies one of the largest plains of Japan. In no other part of the country are transportation facilities so excellent.

THE OSAKA AREA

Industry is scattered throughout the four prefectures, but the greatest development has taken place in and near the cities of Osaka, Kobe, Kyoto, and Wakayama, and of these Osaka is easily the most important. It is the leading manufacturing city of Japan. Indeed, Osaka is one of the leading manufacturing cities of the world.

Osaka is more westernized than is any other city of Japan. It is a hustling, rushing place in sharp contrast to the more leisurely paced Tokyo, still very much a Japanese city despite its long and close contact with western travelers. In Osaka, European dress is much in evidence, for the graceful kimono is out of place in such an atmosphere. Even the harsh clatter of the wooden shoes, or geta, on the pavements, the city sound of Japan, is only a minor note amid the roar and clang of the trams. The streets are crowded with automobiles and the picturesque but slow jinrikisha has almost completely disappeared. The bank and office buildings are in the western style and run to many stories. They dominate the skyline much more completely than do the modern buildings of Tokyo—an evidence partly of the greater degree of westernization and partly of Osaka's greater security from destructive earthquakes.

Osaka is often spoken of as the City of Smoke, for its atmosphere is heavy with the black clouds thrown off from a thousand factory chimneys. The many streams and canals are filthy with oil and with the refuse of the factories lining their banks. There is crowding, and in the industrial sections are to be found slums and dirt and smells. In borrowing the industrial system of the West, Osaka has not been able to avoid its evils.

With all its westernization, Osaka is distinctly a city of Japanese. There are no attractions for tourists and there are very few foreign residents. In 1920, there were only about 100 Occidentals living in the city in a total population of 1,253,000.[1] A few others who have business in the city live in Kobe and commute by the electric railway. The western atmosphere has been created partly by the foreign experts who were brought in to establish some of the industries and have long since departed, and partly by the Osaka business man who is a traveler. He has visited foreign lands and has brought back from Europe and America not only the methods and organization of his business but also something of the Western manner. The energetic Chamber of Commerce with its boosting committees would do credit to an enterprising American mid-western city.

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[1] Statistical Abstract for Osaka, *op. cit.*, 1924.

The Development of Osaka

In its present form, Osaka is a very modern city, more modern even than the industrial development of Japan, for industries were established in other parts of the country before Osaka began its remarkable expansion. The great increase in population has occurred since 1900 and was stimulated especially by the industrial expansion accompanying the Russo-Japanese War and the World War. The population in 1925 exceeded 2,000,000 and Osaka is now the largest city of the Empire, surpassing Tokyo by about 100,000. It should be stated that a part of the growth between 1920 and 1925 was due to the extension of the city boundaries to include an area more than three times the previous area of the city.

The site of Osaka first became important in Japanese history as Naniwano-Saki where, according to legend, the semi-mythical first emperor, Jimmu Tennō, landed on his way from Kyushu to Yamato in 661 B.C. This event is a highly appropriate historical beginning, for it was as a transportation center that Osaka became important in the following centuries. The city has enjoyed brief periods as an administrative center, notably in the fourth century A.D. as the capital of the sixteenth emperor and in the sixteenth century as the residence city of Hideyoshi, the predecessor of the Tokugawa shoguns. With the introduction of Buddhism into Japan in the sixth century, Osaka became the port of contact with Asia and was made the official port of entry for visitors from China and Korea. A reception hall, the Korakan, was erected for the entertainment of diplomats and ambassadors.

It was, however, as a commercial city that Osaka attained its greatest importance. With the beginning of the Tokugawa shogunate, the daimyos sent to Osaka the products of their districts for sale or storage. The city became the center of the rice trade and to this day it is the most important rice market of Japan. So important is it that from the name, Osaka Dojima Rice Exchange, the word dojima, referring to the stream on whose banks the exchange is located, has come to be used throughout the country as one of the synonyms for rice.

During all of the feudal period, Kyoto was the cultural center of Japan. Its population numbered about 1,000,000 and demanded vast quantities of supplies. Osaka, 27 miles distant and connected by the Yodo River, became its port. In Osaka harbor, thousands of clumsy junks that had brought food from the lands about the Inland Sea rode at anchor. All this trade created a merchant class, and it was in Osaka that most of the great merchant families were to be found when Japan was finally opened to the West in the nineteenth century. It is surprising that Osaka did not develop immediately into an industrial center, for in the European countries at the time of the Industrial Revolution, it was the merchant class with their capital who furnished the stimulus to the growth of manufacturing. In New England, the capital for the early cotton factories came from families whose fortunes had been established in commerce. In Japan, however, the merchant class occupied a degraded social position. They were apparently a conservative group and were slow to throw off the shackles of the feudal period. The first encouragement to manufacturing came from the government and from a few far-sighted feudal lords. It was only after they had pointed the way that the merchants appreciated the possibilities of industry and began the industrialization of Osaka.

Advantages for Manufacturing

Osaka has an excellent position for a manufacturing city. It is located on Osaka Bay at the eastern end of the Inland Sea. Such a position tributary to a protected waterway and connecting with the ocean was highly important in a period when transport was easy and cheap only by water. It continues to be important, for it makes possible the importation at low freight rates of bulky raw materials demanded by the factories. In 1924, of the 11,300,000 tons of materials entering the city, 72 per cent were brought by water and the remaining 28 per cent by rail.[1] Water transport is not so essential for the more concentrated and more valuable manufactured goods that are shipped out. Of the 3,400,000 tons leaving the city in 1924, only 40 per cent went by water and the remaining 60 per cent by rail.

Osaka has been able to utilize fully its maritime location only with considerable effort. Osaka Bay is shallow and is being silted up by the streams flowing into it. The harbor, though quite satisfactory for the junks of the feudal period, could not accommodate the vessels of modern design. Until 1903, ocean vessels did not touch at Osaka, and Kobe was the port of entry. Goods were carried to Osaka from the Kobe docks by barge and lighter. The improvement of the Osaka harbor was begun in 1897 and about $25,000,000 have been expended in dredging and in the construction of docks and canals. Though only vessels up to about 10,000 tons can as yet be accommodated, Osaka has become one of the leading ports of Japan and is surpassed only by Kobe and Yokohama.

Not only does Osaka have connections by water with the rest of Japan and with foreign countries, but within the city itself the facilities for water transport are unusual. Osaka is built on the delta of the Yodo River and is intersected by a network of distributaries and canals. It is sometimes called the Venice of Japan or the City of Bridges. Along the miles of waterways the factories are located, and by barge raw materials and fuel are brought in. Some industries also make use of the canals for sending out the finished products.

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[1] Osaka, The Harbour Department of the Municipality, The Port of Osaka, p. 1, 1926.

In discussing other countries, it would scarcely seem necessary to mention topography as one of the advantages or disadvantages for manufacture, but in Japan there is little level land and many cities are cramped by surrounding mountains and find expansion impossible except up steep slopes. Osaka is located on a large open plain, one of the few extensive plains of Japan. Of the large cities, Tokyo and Nagoya are probably the only ones with so favorable a topographic position. The plain stretches for miles back from the sea and though the city has recently greatly extended its area there still remains outside its boundaries a wide expanse of farm land. For many years to come, the growth of manufacturing in Osaka will not be hampered by any scarcity of suitable land.

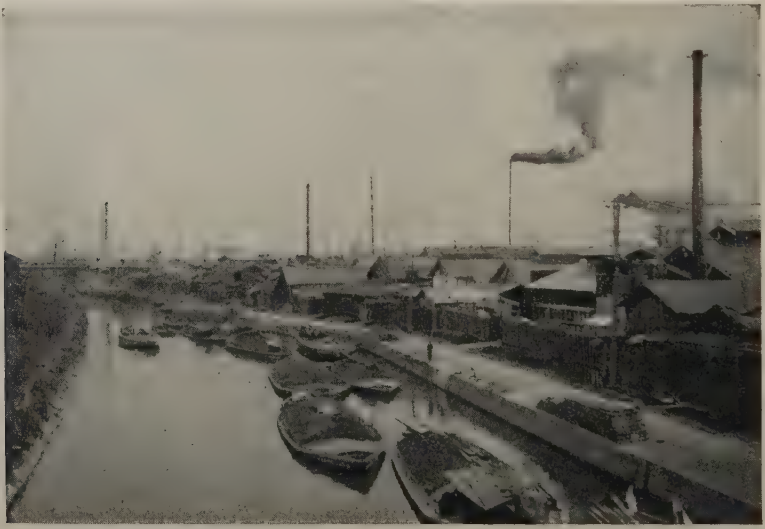

FIG. 45.—A portion of the factory section of Osaka. The buildings are mostly one-story and the establishments are small. Canals are important for transport.

Though the location of Osaka leaves little to be desired, the tributary area is notably poor in raw materials. It produces no coal, no iron ore, no fibers—practically nothing that can be used in the industries of the city. It does produce rice and other foods that are necessary to feed the factory population. This absence of raw materials makes all the more important the excellent transportation facilities of the city. The factories consume annually over 3,000,000 tons of coal, nearly one-tenth of the output of the country. Most of it is brought by boat from northern Kyushu, some 300 miles to the west at the other end of the Inland Sea. Pig iron comes from the same locality. Raw cotton is imported from America, India, or Egypt, and is unloaded at Osaka or Kobe directly from the cargo steamers. For these sources of supply, probably no other Japanese port, with the exception of Kobe, is so well located as is Osaka.

Despite the density of the Japanese population, one of the serious problems of the manufacturer is the securing of an adequate labor supply. In establishing a factory, the available supply of labor must be given as much consideration as the supply of raw materials. Osaka is well located for labor. Surrounding the city is an agricultural belt whose surplus population can be drawn into the factories. The position on the Inland Sea gives easy access to Shikoku and Kyushu, important recruiting grounds for all of industrial Japan. Thus accessibility and transport are as vital to the Osaka factories in the securing of the labor supply as they are in bringing in the raw material and fuel or in disposing of the finished goods.

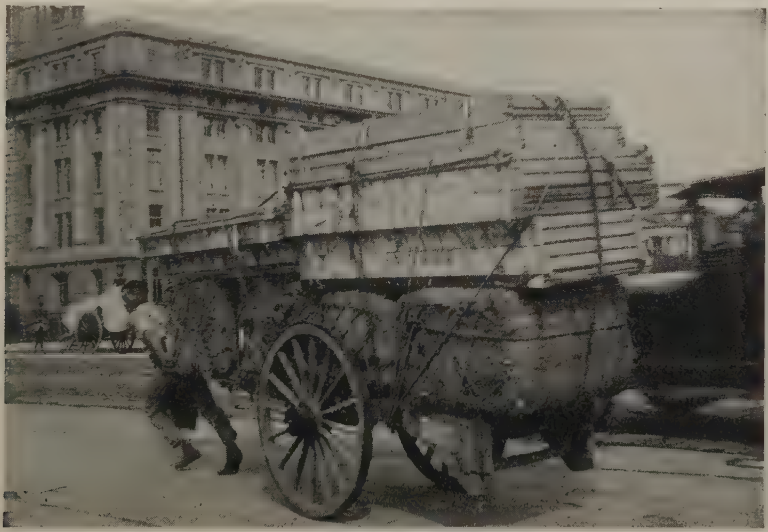

FIG. 46.—Man is a beast of burden even in the modern city of Osaka.

To summarize, because of water transport within and without the city; because of its wide expanse of level land; because of the accessibility to raw materials, fuel and labor; and perhaps to a less degree because of a supply of capital originating from the commercial activities of the feudal period, Osaka has surpassed all the other cities of Japan in industrial development. Though other cities are growing, it seems certain that for an indefinite period Osaka will continue in the lead, for no other city possesses quite so favorable a combination of advantages.

The Principal Manufacturing Industries

The list of manufactures for Osaka is very much like the list for all of Japan. It is long and includes a great variety of industries of about the same degree of importance. Only one, cotton spinning, stands out above the others. Of the 115,000 workers in industry in the city in 1924, slightly over 15,000 were employed in the spinning of cotton yarn.[1] The industry of next importance, the making of wooden and bamboo ware, employed 7,600 workers. The other industries employing more than 3,000 workers were printing and bookbinding, the manufacture of machinery, of iron and steel materials, and of precision instruments, glass making, the manufacture of knit goods, shipbuilding, dyeing and bleaching, and the manufacture of paper goods. Still other industries employing less than 3,000 workers but having products for the year valued at more than 15,000,000 yen included the making of insulated wire, sugar refining, metal refining, cotton weaving, the manufacture of medicines and toilet articles, and the milling of grains.

The Textile Industries

Osaka is the leading Japanese city in the spinning of cotton yarn. Another of its many names is the Manchester of Japan, for in its mills are more than one-tenth of the spindles of the country. The cotton spinning industry began in Osaka with the establishment of one of the earliest Japanese mills by the Satsumas. It prospered and expanded because of the ease of bringing in the raw cotton from India, America, and Egypt, and because of the labor supply available in the immediate vicinity or easily procured in more distant localities. The condition of the atmosphere—a factor important in the concentration of the English cotton industry in Lancashire—has probably been of little significance, for the climate of Japan is so humid that almost any section—certainly in the southern part—would be suitable for spinning. The villages of Sakai and Kishiwada, just to the south of Osaka, are also important centers in the spinning industry. Other mills are scattered in the small towns and villages clustered about Osaka City. The prefecture in 1928 had 21 per cent of the spindles of the country, almost as many as Aichi and Hyogo together, the two prefectures next in importance (see Table VIII and Figure 47).

Though Osaka is the leading prefecture of Japan in the weaving of cotton cloth with 38 per cent of the workers, the industry is of little importance in Osaka City. Weaving has not gone into the factory to any considerable extent. It is still a household industry and does not require the large detached labor supply of the city. Its raw material and its finished product are compact and valuable and can be transported to and from the market with comparative ease. The looms are still to be found chiefly in small establishments in the towns and villages of the prefecture and not in the large cities.

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[1] Statistical Abstract for Osaka, *op. cit.*, p. 89, 1924.

Other textile industries of importance in the city and prefecture are the dyeing and bleaching of yarn and cloth, the manufacture of knit goods, and the weaving of wool and wool-mixed cloth. The dyeing and bleaching industry has developed with the spinning and weaving, and Osaka is now the leading prefecture in the industry. It is only in Osaka that dyeing has become a factory industry. In other parts of Japan, it is still carried on largely in household establishments. The first dyeing factory, started in 1894, had the assistance of French experts during its earlier years. In more recent years, German experts have been employed. The manufacture of knit goods, chiefly of cotton, is a recent industry. It provides a cheap product sold widely throughout Japan and in the warm countries of tropical Asia.

TABLE VIII.—THE DISTRIBUTION OF COTTON SPINDLES IN JAPAN, DECEMBER, 1928[1]

Prefecture	Number of spindles	Prefecture	Number of spindles
Osaka	1,365,880	Nara	69,116
Aichi	848,544	Toyama	64,568
Hyogo	662,916	Ishikawa	60,060
Tokyo	487,312	Shimane	55,896
Shizuoka	386,734	Saga	44,708
Mie	328,944	Fukui	44,504
Okayama	327,320	Kagoshima	42,048
Wakayama	302,648	Shiga	33,172
Kanagawa	169,164	Miyagi	32,296
Ehime	146,596	Tochigi	29,928
Kyoto	121,308	Niigata	29,584
Fukuoka	111,192	Saitama	27,412
Tokushima	109,032	Yamaguchi	22,752
Gifu	108,320	Fukushima	20,800
Kagawa	95,440	Tottori	12,312
Oita	92,516	Kumamoto	12,288
Hiroshima	81,356	Gumma	10,200
Nagasaki	80,880	Total	6,395,884

The weaving of wool cloth is of little importance any place in Japan. There were no sheep in the country prior to the modern period, and the demand for wool cloth has arisen with the introduction of European style of dress for men. Osaka Prefecture ranks only fourth in the weaving of wool and mixed cloth, being surpassed by Hyogo, Tokyo, and Aichi. The industry was introduced into the prefecture through the

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[1] Data from Semiannual Report of the Japan Cotton Spinners' Association, *op. cit.*

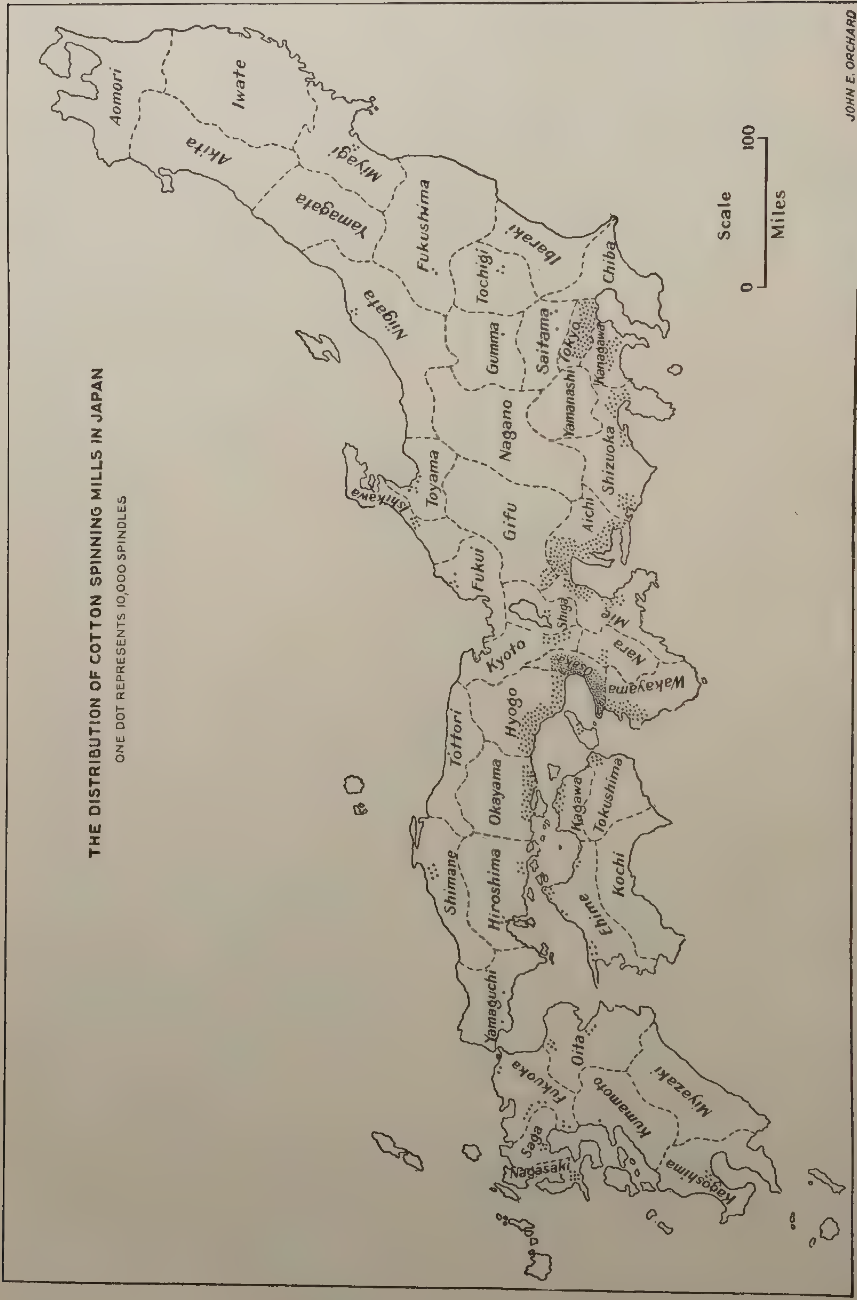
THE DISTRIBUTION OF COTTON SPINNING MILLS IN JAPAN
ONE DOT REPRESENTS 10,000 SPINDLES
Aomori
Iwate
Akita
Miyagi
Yamagata
Fukushima
Niigata
Tochigi
Ibaraki
Gumma
Saitama
Chiba
Tokyo
Kanagawa
Yamanashi
Nagano
Shizuoka
Toyama
Ishikawa
Gifu
Aichi
Fukui
Shiga
Mie
Kyoto
Nara
Osaka
Wakayama
Hyogo
Tottori
Okayama
Kagawa
Tokushima
Shimane
Hiroshima
Ehime
Kochi
Yamaguchi
Oita
Fukuoka
Miyazaki
Kumamoto
Saga
Nagasaki
Kagoshima
Scale
0
100
Miles
JOHN E. ORCHARD

FIG. 47.—The cotton spinning mills have concentrated in the Osaka-Kobe, Tokyo, and Nagoya districts. (Data from Semi-annual Report of the Japan Cotton Spinners' Association, *op. cit.*, December, 1928.)

enterprise of one of the pioneer manufacturers. After several years of study in France, he established in Osaka City in 1896 a factory for the manufacture of *mousseline de laine*, or muslin, a beautiful wool cloth light in weight and fine in texture. It resembles a challis and is used by women for their winter kimonos.

Despite its importance in the other textiles and in industry in general, Osaka has had no share in the development of Japan's leading industry, the reeling of raw silk. It is the only prefecture of the country that does not produce some raw silk. It has been pointed out that the raw silk industry tends to flourish in the uninviting sections of the country where agriculture is difficult and where other industries are few. In Osaka Prefecture, the rural areas are level and well suited to the cultivation of rice. Any surplus labor that there may be is absorbed in the industries of the city.

The two industries of Osaka City ranking next in importance to the textile group have little more than local significance. They are the manufacture of wooden and bamboo ware and printing and bookbinding. The first occupies a position of importance because of the many uses to which wood is put in Japan. Osaka possesses no striking advantages for the industry except that in general the finished product is more bulky and difficult to handle than the raw material, and it is desirable to have the manufacture carried on as near as possible to the market. For that reason, the manufacture of wooden and bamboo ware becomes an important activity in every large population center of Japan. Osaka perhaps possesses some advantage in being able to bring in the timber by water, but that is an advantage that but few Japanese cities do not share. A similar industry is the manufacture of paper goods.

The printing and bookbinding industry is important in Osaka because of the market for newspapers and books. It is a response to the needs of a large population and, in a way, it corresponds to the manufacture of food products wherever the population creates the demand. Practically none of its product enters into foreign trade and only a comparatively small part of it is sent to other parts of Japan.

The Fabrication of Iron and Steel

Osaka City is probably as important a center as there is in Japan for the manufacture of fabricated iron and steel products though other cities may outrank it in specific metal industries. This group of industries has developed in Osaka because of the market and not because of any supply of raw materials, for no coal or iron ore is produced in the vicinity of the city. There are no blast furnaces in the Osaka area though early in 1929 the Asano interests were considering the erection of a 350-ton furnace. Some of the pig iron for the iron and steel industries is imported from foreign countries, especially British India and China. The remainder comes from northern Kyushu or from Sendai or from the Japanese-owned plants in Korea and Manchuria. Water transport reduces considerably the cost of bringing in the pig. There are in Osaka two important steel plants manufacturing sheets, bars, and pipes.

Of the metallic industries in Osaka, the manufacture of machinery is the most important. It depends upon the local demand for all kinds of machines in the many industries of the city. It is much more economical to bring in the bars, rods, plates and other steel parts and to assemble them near the market, than to attempt to transport the bulky and easily broken machinery any distance. Other examples of this principle are the manufacture of textile machinery in the textile centers of Lancashire and New England, of shoe machinery near Boston, and of fruit-canning machinery in California. The machine industry would be of much greater importance in Osaka than it is today if the Japanese had made a greater advance in mechanical and technical skill. As it is, machines that demand precision and accuracy are still imported from England, Germany, and the United States. The greatest development in machinery in Japan has probably been in the manufacture of electrical apparatus. Osaka Prefecture now ranks second to Tokyo in that industry.

A supply industry for the machinery industries is the manufacture of hardware—bolts, nuts, nails, chains, cables, springs and rivets. Osaka City is the leading market of Japan for such products and the prefecture is the most important center for their manufacture.

There is in Osaka some shipbuilding, but because of the shallowness of the harbor, it is possible to build there only the smaller vessels. Kobe, on deeper water, completely overshadows Osaka in shipbuilding, and for that reason the more detailed consideration of the industry in this part of Japan will be included in the discussion of the industries of Kobe. Other heavy industries of Osaka are the manufacture of railway equipment, marine engines, bridge steel and structural steel.

Sakai, a city situated 4 or 5 miles from Osaka, was famous for its swords and armor during the feudal period. The industry was destroyed by the edict of 1876 forbidding the wearing of swords. The new weapons were so unlike the old that the artisans turned not to the making of guns but to the manufacture of knives and other edged tools, and Sakai has become the center for the cutlery industry. This is one of the few modern industries, and Sakai is one of the few modern industrial centers, to have a direct connection with the industrial structure of the period before the opening of the country. In some instances the connection is very direct. The ancestors of the proprietor of one shop visited in 1926, now making fish knives and scissors, were famous swordsmiths of the seventeenth and eighteenth centuries. In the old days, the warriors on their way to the Imperial Court at Kyoto provided the market for the Sakai metal workers. The chief market of the modern industry is in Osaka and Kobe and in other industrial centers. Raw materials were, and still are, brought from a distance. According to the president of the Sakai Cutlery Trade Association, 60 per cent of the raw materials for the industry are imported from America and Europe and 40 per cent from the Imperial Steel Works at Yawata and from Yonago in the Hoki district (now Tottori Prefecture) of western Honshiu, one of the very few localities in which the ancient Japanese iron industry has survived. The stones for polishing and grinding are obtained in Shikoku and Kyushu.

Osaka is the most important center of Japan for the manufacture of glass though not a single one of the necessary raw materials is produced near at hand. The kaolin and the quartz for the cheaper products are brought from near Nagoya, nearly 100 miles distant by rail and much farther by water; the silver sand for the finer qualities is imported from France and Belgium; and the fuel comes from Kyushu or Hokkaido. The industry located in Osaka apparently because there existed in the city in the early years of the Meiji period a glass industry established under Dutch influence. It persisted and developed there because of the large local market for glass and because of the excellent transportation facilities for bringing in the raw materials and for shipping out the finished product. Many of the founders of the modern industry received their early training in the government glass-making school in Tokyo where English methods were taught by English teachers.

A specialized glass industry is the making of imitation pearl beads. There are in Osaka 30 or 40 establishments, all of them small. It is not a factory industry, for most of the work is done in the homes by women and children. The product is entirely for export as there is no demand for it in Japan.

The manufacture of brushes is an industry of Osaka of interest not because of the number of workers employed or because of the value of product, for both are small, but because Japanese brushes have become known throughout the world and because practically all of them are made in Osaka. It is an industry located almost entirely by cheap labor, chiefly the labor of farmers' wives and daughters or of the families of factory workers. The raw materials are assembled from the corners of the earth—the bristles from North China, the bone from Chicago, the cabinet woods from Java.

It would not be profitable to enter into a detailed discussion of the other industries of Osaka. For the most part they are industries, like the chemical industry, attracted by transportation or by labor supply; or they are subsidiary industries depending for their market upon the major manufacturing activities of the city.

Outside of the three principal centers—Osaka, Sakai, and Kishiwada—there is some manufacturing scattered throughout the villages of Osaka Prefecture. Most of it is on a small scale, either in small factories or in domestic workshops. It is limited to the light industries such as the weaving of cloth or the manufacture of paper goods and woodenware. The heavy industries are not important in the villages, for they must be in the cities where there is available an abundant supply of labor and where transportation facilities are well developed.

THE KOBE AREA

The second manufacturing center of this section is the city of Kobe in Hyogo Prefecture. It is only 20 miles distant from Osaka, and on the level stretch of land connecting the two cities there are many factories and industrial villages though most of the land is still agricultural. Kobe shares many of the advantages for manufacture possessed by Osaka, and in some respects is even more favored. Both are ports, but Kobe has a deeper natural harbor and large vessels can tie up at the docks. It is a terminus for much of the Japanese line traffic, especially for the lines connecting with the more distant parts of the world. Osaka, on the other hand, because its harbor until recently could accommodate only the smaller vessels, is more important in tramp traffic than in line traffic. Even the raw materials consumed in the Osaka factories are imported through Kobe for the most part. The raw cotton from British India and America, the raw wool from Australia, the crude iron manufactures from India, and machinery from Europe and America are carried in liners or in vessels too large for the Osaka harbor. The cargoes are unloaded in Kobe and then transported to Osaka by small boat or lighter. In 1927, for example, 1,216,000,000 pounds of raw cotton were imported through Kobe and only 187,000,000 pounds through Osaka, though there are in Osaka Prefecture more than twice as many cotton spindles as there are in Hyogo Prefecture. For the export trade, Kobe also has the advantage, for the export goods are mostly of small bulk and are carried on line steamers. They are sent from Osaka to Kobe by rail or water. The distance is short and, because of their relatively high value, the cost of this transport is not an important item.

Osaka does export directly large quantities of cotton yarn and cotton cloth which go mostly to China and are carried in the smaller line vessels that can touch at Osaka. In recent years, Osaka has been the leading port of Japan in the export of these textile products. It is significant that over 60 per cent of the exports passing through the port of Osaka go to China, and most of the remainder to other Asiatic countries. Of the exports from Kobe, however, only one-fifth go to China and over 40 per cent to North America and to Europe.

The Advantages and Disadvantages for Manufacturing

Despite its superiority as a port, both for receiving raw materials and for sending out finished goods, Kobe has had no such development in manufacturing as has Osaka. The city suffers under a severe handicap that cannot be easily overcome. Osaka is located on a large open plain, but Kobe is confined to a narrow coastal strip with little room for growth. As one enters the harbor of Kobe, he is confronted by a high and continuous row of hills, known locally as the Kobe Alps, extending to right and to left as far as the eye can reach. There seems to be no place for a city of any size, for the slope is steep and the ridge is high and inaccessible. On closer approach, however, one sees that between the heavily wooded slope and the sea there is a narrow shelf, and on it Kobe has been built. The city is necessarily a ribbon city stretching along Hyogo and Kobe harbors for more than 2 miles and in no place more than three-fourths of a mile wide. Of this width, the larger part is the residential district in the lower hills. The commercial and industrial part of the city is confined to a much narrower strip along the water front. Kobe suffers under the handicap of many Japanese cities and, in fact, of all Japan: it lacks level land upon which its industries can expand. So serious is this handicap that it is unlikely that Kobe will have much further industrial development. Already, factories are being forced to move out of the city to secure the necessary space for expansion. The largest rubber factory under Japanese control has selected a site for a new establishment in a village on the plain between Osaka and Kobe because its quarters within the city are becoming too cramped and the land for additional buildings is not available.

The city and the location have always been predominantly commercial, and commercial Kobe seems destined to remain. When the foreigners first came, there were three or four small villages on the site of Kobe, dating from at least the eighth century. They were engaged principally in fishing and in the coastal trade. It was at one of these villages, Hyogo, that the Portuguese landed in 1542. The real importance of the port began, however, with its opening to foreign intercourse in 1868. The port and the modern city of Kobe were developed by the British and American merchants and in the earlier years of the modern period most of its business was conducted by foreigners. Even today, foreign concerns probably occupy a position of greater relative importance in Kobe than in any other Japanese city. Since the destruction of Yokohama in 1923, Kobe is the only city of Japan in which there is a foreign settlement of any size.

The Principal Manufacturing Industries

The topographic handicap of Kobe was not felt in the early days of its development. Docks could be built into the sea, and the shore afforded space for warehouses. As the city grew in commercial importance, industry was stimulated in much the same way that trade gave rise to manufacturing in New York and in the New England cities, but the rugged topography kept the establishments small. At the present time, the most important industry is shipbuilding and in Kobe are located the Kawasaki and Mitsubishi shipyards. Prior to the opening of Japan, fishing boats and small junks were probably built on Hyogo and Kobe bays, but this ancient industry bears little relationship to the present huge yards constructing merchant ships and battleships of 20,000 tons. The modern industry, both in its establishment and in its development, owes much to government assistance. Indeed, without government aid, it could probably never have continued. Recently, the Kawasaki Dockyards became so involved financially that the government was forced to take the plant over for operation by the Navy Department.

The shipbuilding industry of Kobe is an example of the establishment of an industry by the government without due consideration of all geographical factors. The harbor is excellent for shipbuilding purposes, and the water is deep enough for the launching of large vessels. The topography offers no handicap, for the narrow strip of land along the shore is sufficient for the yards. The materials and the fuel, however, must be brought from Kyushu, a distance of approximately 330 miles. Osaka has the same handicap and in addition its harbor is too shallow to permit the building of ships larger than 10,000 tons. Though this section is still the leading shipbuilding district of Japan, the industry is beginning to shift from these two ports to the ports of northern Kyushu near the source of raw materials. It is unlikely that there will be any considerable expansion of shipbuilding either in Kobe or Osaka.

Hyogo is the third most important prefecture in cotton spinning, but the industry is located not in Kobe but in the smaller towns, such as Amagasaki between Kobe and Osaka, and Akashi and Himeji, located on the railroad running toward the west along the Inland Sea, to which the raw cotton can be carried easily by rail. The scarcity of level land has undoubtedly been an important factor in retarding the development of the spinning industry in Kobe, for it must be conducted on a fairly large scale and the mills demand a considerable area. There is only one spinning mill in the city, and it is located in the outskirts on one of the few available open spaces. With its 104,000 spindles, it is one of the largest spinning mills in Japan.

There is in Kobe a variety of small industries of which the two most important are the making of matches and of rubber goods. Hyogo is the leading prefecture in the making of matches, practically the entire industry being centered in Kobe. In the prefecture are employed 86 per cent of the workers in Japanese match manufacturing, and the output is by value over 90 per cent of the match output of the entire country. The industry began in Kobe because Kobe was one of the ports through which foreign matches were imported immediately after the opening of the country, and the people quickly appreciated their value. The expansion of the industry was due to the market in south China established through the direct contact between the Chinese living in Kobe and their homeland. At about the same time, Osaka was also developing a match industry with a market in north China, due to the fact that the Chinese who settled in Osaka were largely from that section. The Osaka industry happened to specialize in the manufacture of white phosphorus matches. The agitation against their manufacture and use, especially in Europe and America, finally led to the framing of the Berne Convention of 1906 which bound the contracting countries to prohibit the manufacture, sale or importation of matches containing white phosphorus.[1] The Japanese export of white phosphorus matches began to decline in 1913 with the passage of the law prohibiting their importation into India. Their manufacture in Japan was prohibited by the Act of 1921, and the Osaka industry disappeared. Kobe made safety matches and the industry has continued to grow until very recently. During the World War, the market was extended to southeastern Asia and India and even to the United States, but the establishment of local match industries in India and in China and the keen competition of the Swedish and Norwegian producers since the war have greatly curtailed exports. Between 1919 and 1927, the annual value of the match exports of Kobe declined from $12,000,000 to little more than $4,000,000.[2] The chief market is now Hong Kong and Canton.

The principal advantage of Kobe for the match industry, aside from the early start, is labor. The industry began as a household industry and it was not until 1878 or 1879 that the first factory was established and the first machine, a German frame-filling machine, was installed. It is now a factory industry but the largest establishment of Kobe employs only 700 workers, and many factories have only 50 or 60 workers. The boxes are still made largely in the homes, and the factories are scattered throughout the city in order to be assured of a labor supply. The workers are chiefly the wives and daughters of laborers in other industries. The only raw material produced in the neighborhood is the pine for the boxes. The aspen timber for the splints is brought in, in the form of logs, from Siberia and a small amount from Hokkaido. Some of the paper for labels is made and printed in Japan, but some, because it is cheaper, is imported from Germany, Norway, and Sweden. The red phosphorus for the striking surface on the boxes is partly Japanese and partly English and German. The resin is imported from the United States and the paraffin from the United States and Borneo. The greatest handicap that the industry labors under at present is the unfavorable reputation of Japanese matches, gained during the period of widest markets when insufficient attention was given to quality.

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[1] Memorandum on the International Conference on Labour Regulation held at Berne, September, 1906.

[2] Kobe, Municipal Office, Department of Commerce and Industry, The Important Exports of Kobe (in Japanese), 1924; Financial and Economic Annual of Japan, *op. cit.*, 1928.

The other particularly significant industry of Kobe is the manufacture of rubber goods. In the city are located about 40 per cent of the workers in rubber factories in Japan. The location of the industry in Kobe, as has been pointed out in an earlier chapter, is to be explained partly by the location there of a large foreign rubber concern and partly by the fact that Kobe is the terminus for the line traffic passing through Singapore, the great primary rubber market of southeastern Asia. Of the total crude rubber imports of Japan in 1927, 72 per cent entered the country at Kobe. The principal products of the industry are tires for bicycles and rikishas, and rubber shoes and boots which are cheaper than leather shoes and are used widely in northern Japan and Korea. Aside from the large factory of the Dunlop interests, the industry is on a small scale. The largest Japanese factory employed only 200 workers in 1926, and most of the factories had from 40 to 50 workers.

Hyogo Prefecture ranks first in the weaving of woolen cloth and wool and cotton-mixed cloth, and seventh in the weaving of cotton cloth. Both of these industries are carried on in small establishments and are located in the villages and smaller places rather than in Kobe. The woolen industry has become important in the prefecture perhaps because of the advantages of Kobe for the import of the raw wool from Australia and perhaps because of the early influence of the foreigners. Of the total import of raw wool into Japan in 1927, 93 per cent came from Australia; 31 per cent entered at Kobe and 23 per cent at Osaka. The cloth is woven almost exclusively for the domestic trade, for wool is a new textile for Japan. The raw material must be imported and the Japanese have not become sufficiently skilled in its weaving to compete in foreign markets with the products of Europe and America. The value of all the woolen and the wool-mixed-with-cotton cloth exported from Japan in 1927 was only $2,900,000, or less than 1.5 per cent of the value of the exports of cotton cloth.[1]

The remaining industries of Kobe and of Hyogo Prefecture are of no great importance. They include the brewing of sake, in which industry the prefecture ranks first, the manufacture of electrical apparatus, the making of paper and pulp, the spinning of silk, the making of hardware, glass, and soy, and the refining of metals. It seems certain that, though Kobe will continue as an industrial city of some importance, its expansion in manufacturing will be greatly hampered by its topographic handicaps. Its greatest development will be in trade as the commercial outlet of the Osaka-Kobe-Kyoto area and, in fact, of all south central Japan. In other parts of Hyogo Prefecture, industries may develop to take advantage of the easy import of raw materials and the export of finished goods.

THE KYOTO AREA

The third manufacturing city of the Osaka-Kobe-Kyoto area is the city of Kyoto. It affords a marked contrast to Osaka and Kobe, the other two cities of the area. Kyoto was the industrial center of feudal Japan, but, chiefly because it is an inland city without the great advantage of water transport, it is not well located for the new industries and has had no such manufacturing development as Osaka, Tokyo, Kobe, and Nagoya—all coastal cities—have experienced. Though there are in Kyoto thousands of workers, it is not a city of factories. In the spinning of cotton, Kyoto Prefecture ranks eleventh with only 2 per cent of the spindles of the country, and in silk reeling, sixteenth with less than 1.5 per cent of the basins.

The Principal Industries

Kyoto has lost much of its former industrial importance with the introduction of western industries and with the shifting of the Court to Tokyo. Japanese industries are no longer confined to the fashioning of exquisite works of art intended for the rich and cultured members of the Court circle. Industry is now concerned with staples for general use and for the export market. But the industries of Kyoto Prefecture and City are chiefly survivals of the feudal period—artistic industries, catering originally to the demands of the wealthy Japanese and now to the tourists attracted to Kyoto by its classic traditions, the Imperial

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1927.

Palace, the bells and the torii, and the countless temples and shrines in the wooded hills. There are two large potteries, one manufacturing porcelain for the electrical and chemical industries and the other, established in 1645 as a household industry, turning out rather fine ware, a part of which is exported. Most of the industries, however, are still workshop industries and the workers are craftsmen. Centered about the two hotels frequented by the foreign visitors are many small establishments, turning out damascene, cloisonné, pottery, lacquer ware, bamboo ware, bronzes, metallic inlays and toys. The only apparent change that has taken place in the last half century is a deterioration in artistic values due to the tendency to emphasize quantity rather than quality in production. The artists have not disappeared completely and there are, for example, small domestic potteries that make expensive pieces and cater only to wealthy Japanese, but the wares of real merit are being submerged by the flood of inferior goods.

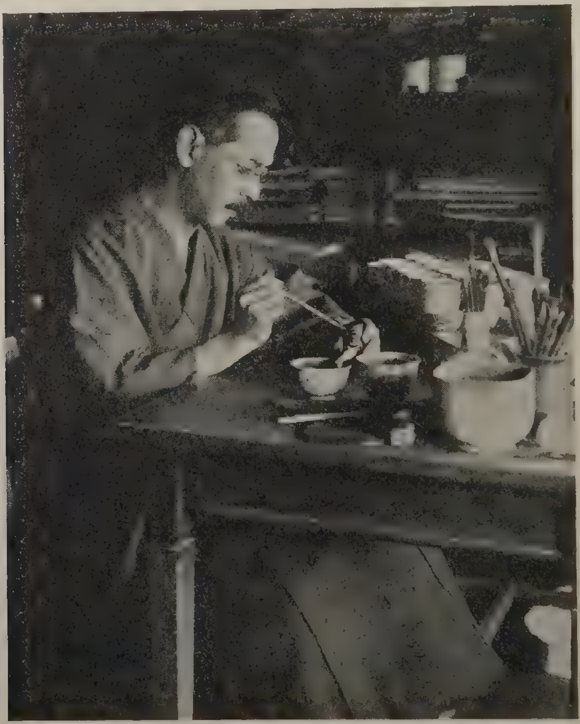

FIG. 48.—Fine pottery is made in Kyoto in small household workshops which are almost identical to the feudal establishments. The artist Rokube in his workshop. (*Courtesy of the artist.*)

Much more important than this group of industries, but also an outgrowth of the feudal industries, are the weaving of silk cloth, the twisting of silk thread, and dyeing and bleaching. These three industries employ almost one-half of the factory workers of the prefecture, but the factory statistics do not begin to measure their importance, for many of the establishments are so small that they and their workers are not included in the factory reports.

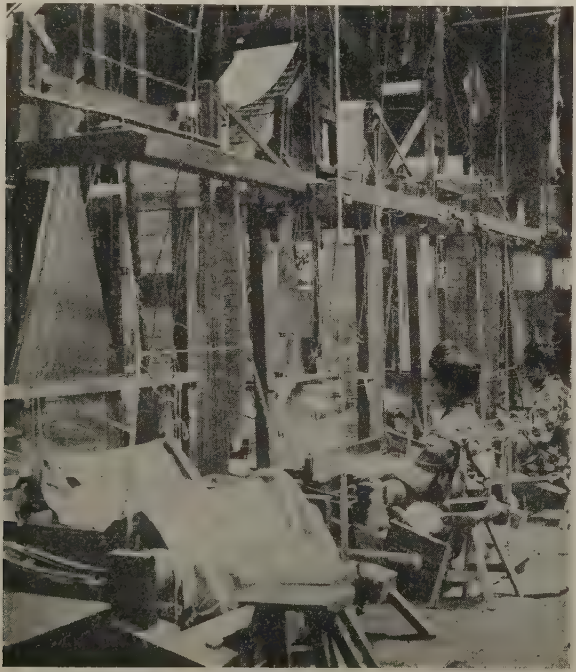

FIG. 49.—In Kyoto there are many households weaving brocades on foot power looms. This establishment of ten looms is comparatively large.

Silk weaving is concentrated in the Nishijin section of the city. The industry has been important there for perhaps a thousand years. In this section were woven all the fine silks that contributed to the magnificence of the Imperial Court during the feudal period. It was the product of this section that was probably responsible for the tales of the splendor and wealth of Cipangu carried back to Venice by Marco Polo.

With the westernization of the country, the silk weaving of Kyoto has undergone little change. It has not become a factory industry, and the establishments are small. Most of the looms are still hand looms. In 1925, of the 21,000 looms owned by the members of the weavers trade association only 4,000 were power looms.[1] The product is mostly

[1] Kyoto Nishijin Weavers' Trade Association Report (in Japanese), 1925.

figured and damask silks and brocades made in the narrow width for Japanese use. One of the officials of the weavers' association estimated that in 1926 not more than 3 per cent of the annual output was exported.

The dyeing and bleaching industry is almost as old as Kyoto. During the period when Nara was the capital, the sumptuary laws forbade the wearing by the common people of anything but the most ordinary dyes. The dyeing industry was a part of the Imperial Household and when the capital was moved to Kyoto in 794, the industry was moved with the Court. The earliest dyes were made from roots and grasses and were limited to reds, blacks, and yellows. Later, mineral dyes were imported from China and soon after the opening of the country to trade, European dyes were brought in. The Kamo River flows through Kyoto, and its water is excellent for dyeing. The early industry located along the Tokano-gawa, its left branch. Later, there grew up near the Nishijin silk section a second dyeing center making use of water from wells. Due to the law prohibiting the erecting of large factories in Kyoto, the most recently developed dyeing section is located on the southwestern outskirts of the city. It is engaged chiefly in the dyeing of cotton. Though the industry originally dyed only the cloth woven in the city, the skill of the workers and the excellence of the water supply have attracted cloth from other prefectures. In 1926, the dyers' trade association estimated that 80 per cent of the cloth dyed and bleached in Kyoto was woven in other prefectures. Only a small part of the cloth was for export.

It will be seen that Kyoto can scarcely be considered a part of modern industrial Japan. Though it was the only industrial center of the feudal period, there are in the city fewer evidences of an industrial revolution than in any other large city of southern Japan. The industries are Japanese in origin and Japanese they have remained. Kyoto emphasizes just how tenuous are the bonds linking the past and the present of industrial Japan and how completely the industrialization that is now found in Osaka, for example, has been imported from the West and established entirely independent of the Japanese industrial background. The failure of Kyoto to westernize affords further evidence of the vital part played by cheap water transport in the localization of the new industrial system.

The fourth and last manufacturing city of this area is Wakayama. It is much less important than any of the other three. It is an outlier or satellite city about 40 miles south of Osaka and connected with that city by water, by electric tramway, and by steam railroad. The important industries of the city and of Wakayama Prefecture are the textile industries and include cotton spinning, cotton weaving, silk reeling, and dyeing and bleaching.

CHAPTER X

THE OTHER INDUSTRIAL CENTERS

THE other major centers of the Tokyo-Nagasaki industrial strip are the Tokyo-Yokohama center, Nagoya, and northern Kyushu. They are all of much less importance than the Osaka-Kobe-Kyoto center, but they have made much more progress in industrialization than any of the other parts of Japan and in each manufacturing is an outstanding activity.

THE TOKYO-YOKOHAMA CENTER

The Tokyo-Yokohama industrial center, including the prefectures of Tokyo and Kanagawa, is second in importance to the Osaka-Kobe-Kyoto center. It possesses many of the advantages of the latter for manufacturing. Tokyo and Kanagawa Prefectures are situated on the coast, and raw materials can be imported and the finished goods exported cheaply by sea through the two ports of Yokohama and Tokyo. Yokohama has one of the finest harbors of Japan. It is large, deep, and well protected. It can accommodate the largest vessels and occupies an important position in line traffic. Since the beginning of the modern period, Yokohama and Kobe have been rivals for the position as the leading port of the country. Because of its control of the raw silk exports, Yokohama has led in value of exports every year since 1873, the first year for which classified trade returns are available, and in 6 of the 10 years immediately preceding the earthquake of 1923, Yokohama surpassed Kobe in the value of combined exports and imports.[1] Despite the destruction of the city and all of the harbor works by the earthquake, Yokohama was a close second to Kobe in the value of goods entering and leaving the port in the following year, a position that is still retained.[2] The harbor of Tokyo is shallow and the larger vessels cannot enter. The port is of no importance in foreign commerce though it does have a considerable coastwise trade. In foreign trade, Yokohama serves as the port of Tokyo.

The Tokyo and Kanagawa prefectures probably have as large a percentage of their area in plains as any prefectures of Japan. There is ample land for the construction of factories and the conditions are favorable for the development of land transportation. The two prefectures are well located for a supply of labor. When the industrialization of Japan began, Tokyo was already a large city, the largest of the Empire, and the population provided the labor for the newly established industries. In more recent years, it has been necessary to recruit labor from more distant areas, but Tokyo is as conveniently located as Osaka for drawing the surplus population from the rual districts.

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924.

[2] *Op. cit.*, 1927.

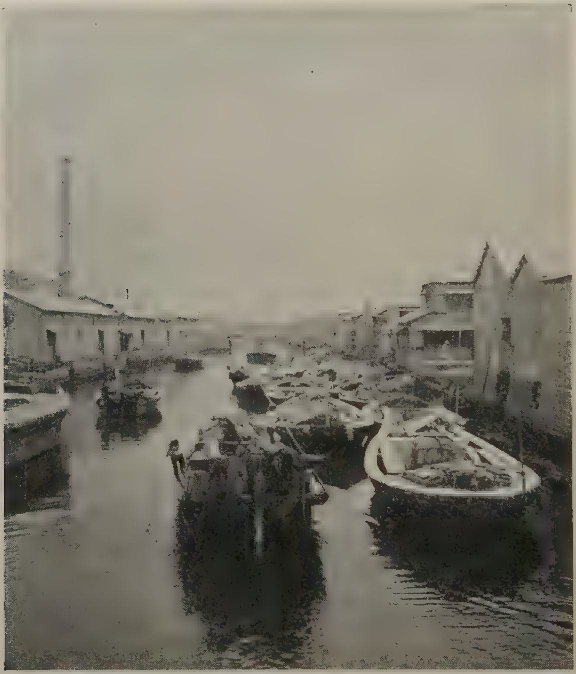

FIG. 50.—Canals in the factory sections of Tokyo are used for the transport of raw materials and finished goods.

There are no important sources of raw materials in the vicinity of Tokyo or Yokohama. Some of the materials consumed in industry are imported from foreign countries; some come from other parts of Japan, usually by sea, though Tokyo does have good rail connections with northern, central, and western Japan. Tokyo is perhaps not so well located as Osaka for coal and iron materials. The coal fields of Hokkaido and the iron industry of Sendai are nearer, but northern Kyushu, Japan's principal source of these materials, is fully 600 miles distant.

The localization of manufacturing industries in Tokyo City is determined by their dependence upon water transport. They are concentrated in the southern part of the city in the wards lying along the water where it is possible to utilize the bay, the numerous canals, and the Sumida River for the bringing in of raw materials and fuel, perhaps from the ships unloading at Yokohama, and for carrying out the manufactured goods. The four waterfront wards of Honjo, Shiba, Kyobashi, and Fukagawa are the leading industrial wards of the city, and within them were employed 59 per cent of the factory workers of Tokyo in 1926.[1]

The Principal Manufacturing Industries

The industries of the Tokyo area present several contrasts to the industries of Osaka. Small establishments, scarcely more than family workshops, are very important in both areas. They employ most of the workers and probably turn out the major share of the manufactured product. In Osaka, however, there has been a considerable development of large factories, much more so than in Tokyo. The Osaka factory section still has a skyline essentially of small one-story buildings but pushing up above the general level are many larger buildings. In Tokyo, on the other hand, the large factory is the exception. There are thousands of small shops turning out a multitude of products. Of the 87,800 persons engaged in manufacturing industry in Tokyo City on Dec. 31, 1926, 27,500, or 31 per cent, were in establishments employing fewer than 15 workers.[2] This number does not fully measure the extent of the small establishments, for the statistical returns of the city do

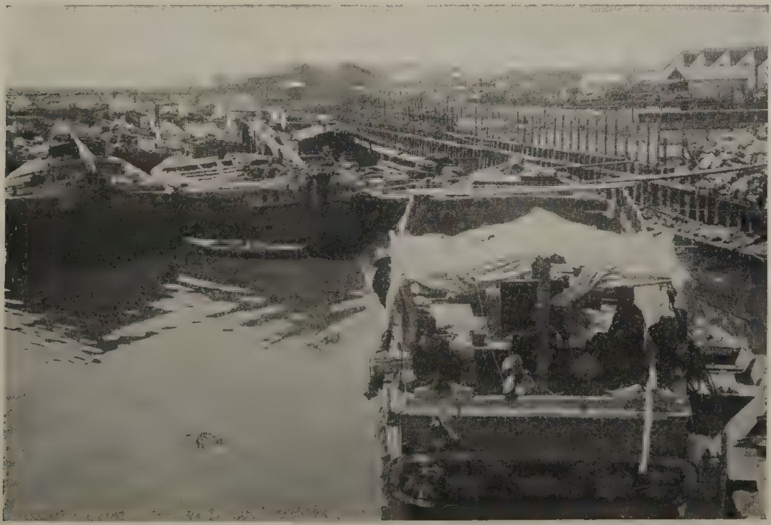

FIG. 51.—The one-story buildings and the slender smoke stacks in the Tokyo factory section indicate the small size of the industrial unit.

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[1] Annual Statistics of the City of Tokyo, *op. cit.*, p. 919, 1928.

[2] *Op. cit.*, p. 951.

not include the establishments with fewer than five workers that do not use power.

Tokyo has suffered under the handicap of frequent destructive earthquakes and even now in 1930 the city is still in the process of being rebuilt following the earthquake of 1923. Destruction alone, however, does not explain the minor importance of the large factory. Osaka, due to its more convenient position with reference to the coal of Kyushu, has been able to develop the heavy metal industries and the chemical industries. They are modern, western industries and must be conducted in large units. It is this group of industries that has been responsible for the largest factories of Osaka. In Tokyo, though there are metal industries, they specialize in more highly fabricated products, and they can be carried on successfully in smaller workshops.

The leading industry of Tokyo in the number of workers employed is printing and bookbinding, but it is an industry of no international importance, for it is a response to the immediate consuming market and to the position of the city as the seat of the government offices. In no other city of Japan is there so great a demand for printing, and in no other district is there to be found a printing and binding industry employing half as many workers. It is a small-scale industry, however. I spent several hours one afternoon searching for the printing plant that published the official weather maps of the Government Meteorological Observatory. I finally found it in a small building, not much larger than a home, tucked away from the street behind a row of stores.

The Metal Industries

The principal industry of more than local significance is the manufacture of electrical apparatus. Tokyo is the leading prefecture of the country in that industry, and Tokyo and Kanagawa Prefectures combined have about one-half of the workers employed in electrical factories. The industry probably located in this part of Japan because of the large market for electrical goods in Tokyo. It has expanded because of the remarkable increase that has occurred throughout the country in the use of electrical appliances, due to the abundance of hydroelectric power and the encouragement of the government in its development. Almost every village, no matter how remote, has electricity and its use is common even on the farms. The present importance of the Tokyo-Yokohama district in the production of electrical equipment is to be explained by the location in Tokyo City and in Tsurumi, near Yokohama, of the main plants of the Shibaura Engineering Works, Ltd., a Japanese subsidiary of the General Electric Company. It is the only large concern in the industry and employs 3,000 workers in one plant and 1,000 in the second. The other establishments in the industry are small factories and domestic workshops. The Shibaura Company produces 70 per cent of the fans used in Japan and 50 per cent of the electrical equipment. Its production is entirely for the domestic market under an agreement with the General Electric Company.

Another metal industry, in which Tokyo ranks second to Osaka, is the manufacture of hardware—nuts, bolts, nails, chains, springs, small tools, agricultural implements, kitchen utensils, and similar highly fabricated articles. The establishments are small, a typical one visited in 1926 having only 32 workers. The principal market is the government which demands large quantities of such things for its naval and military establishments and for the railroads. The bar and rod steel comes from Kyushu. Tokyo is also a center for the manufacture of scales, meters, and gages. The leading heavy industry of the district is shipbuilding, Kanagawa ranking third among the prefectures and Tokyo fifth. This area, however, is even less favorably located than the Osaka-Kobe section for securing the raw materials for shipbuilding.

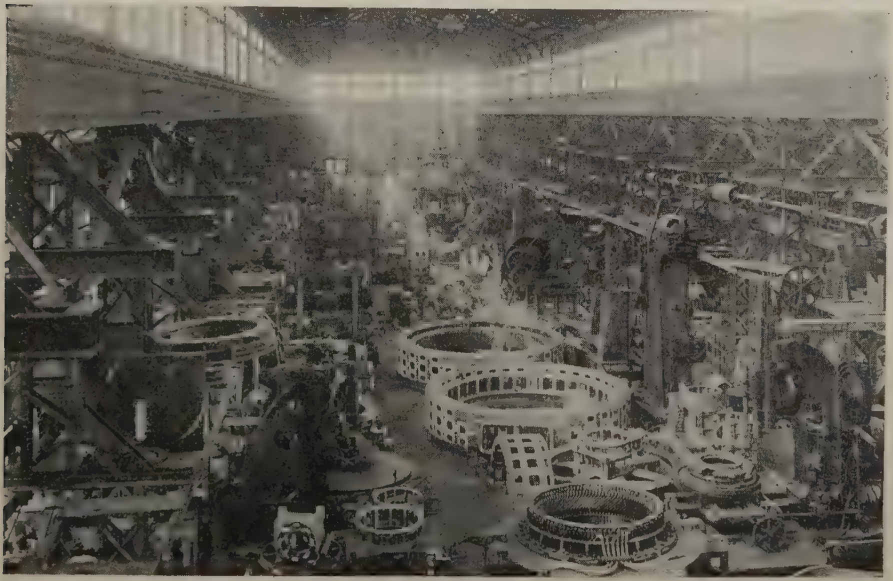

FIG. 52.—The machine shop of the largest manufacturer of electrical equipment in Japan. (*Courtesy of the Shibaura Engineering Works, Tokyo.*)

The Textile Industries

More important than the metal industries is the manufacture of textiles, including the spinning of cotton yarn, the weaving of cotton cloth, and the weaving of wool cloth and wool and cotton mixed. In the spinning industry, Tokyo ranked second to Osaka in 1920, but in the last few years both Aichi and Hyogo Prefectures have advanced very rapidly, and Tokyo now stands in fourth place both in number of workers in the industry and in the number of spindles. This loss of prestige has been due in part to the destruction of mills by the earthquake of 1923. Destruction was even greater in Kanagawa Prefecture than in Tokyo, and between 1920 and 1925 the number of spindles declined from 112,000 to 99,000. The industry is now recovering rapidly and Kanagawa had 169,000 spindles in 1928.[1] Because of the policy of the large companies to locate their new mills in centers of population where there are comparatively few factory industries and therefore where the competition for the labor supply is less keen, the spinning industry is not in Tokyo City but in the suburbs and in smaller towns. Hachioji, a textile center of the feudal period, and Akabane are important.

In the weaving of woolen cloth and of cloth of wool and cotton mixed, Tokyo Prefecture is a very close second to Hyogo. The cloth is partly of the type suitable for men's suits. It is produced to meet the demand created by the adoption of western dress and to supply the materials for the uniforms of railway workers and police, and of soldiers and sailors. A part of the product is the *mousseline de laine* used for kimonos. Thus, the woolen industry caters both to the new and to the old Japan. The two products and their markets are so distinct that they are rarely woven in the same factory though a company may have one branch for the manufacture of the suitings and another for the muslin.

The prefecture ranks only ninth in the weaving of cotton cloth. Aside from a few large factories attached to the cotton spinning mills, it is an industry of small workshops, as it is for the most part in the other prefectures of Japan. One of the first of the new industries introduced into Tokyo was the manufacture of shoes and men's clothing in the European style in response to the adoption of western uniforms for the army and navy. A government report of 1876 stated that there were in Tokyo a large number of places for the manufacture of clothing and shoes, and that sewing machines could be counted by the hundreds.[2] Tokyo is still a leading center for the manufacture of foreign clothing. In addition to the military establishments and the government factory for the making of railway uniforms, there are smaller establishments for making civilian clothing to be sold in the department stores.

Tokyo Prefecture ranks second in the manufacture of glass and of rubber, and occupies an important position in dyeing and bleaching, the making of paper and pulp, and the weaving of silk cloth and of cloth of silk and cotton mixed. The glass industry is a striking example of the contrast in the size of establishments in Osaka and in Tokyo. In Osaka, glass is made in fairly large factories. In Tokyo, the industry is carried on in small workshops. One visited in 1926 employed only 40 men and it was said that in the same section of Tokyo there were 300 establishments of about the same size.

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[1] Semiannual Report of Japan Cotton Spinners' Association, *op. cit.*

[2] Imperial Commission to the International Exhibition at Philadelphia, *op. cit.*, p. 80.

The prefecture of Kanagawa, in addition to the shipbuilding, the cotton spinning, and the manufacture of electrical apparatus, is important for hardware manufacture, glass making, and silk spinning, an industry quite distinct from silk reeling. In the last named industry, it is the leading prefecture of Japan. From the beginning of foreign intercourse, Yokohama has been the principal exporting port for raw silk and the silk exporters located there have established close contacts with all the raw silk producing districts of Japan. It was a natural development to concentrate at Yokohama the refuse silk and double cocoons that cannot be reeled. They are spun into thread in much the same fashion that yarn is spun from the raw cotton.

THE NAGOYA CENTER

The nodal area of third importance in the Tokyo-Nagasaki industrial strip is the Nagoya center including the prefectures of Aichi, Mie, and a small part of Gifu. It is situated on the south shore of Honshiu between Osaka and Tokyo, approximately 140 miles by rail from the former and 235 miles from the latter. In its advantages for manufacturing industry, the Nagoya area resembles very closely the two industrial areas already described. The leading manufacturing city is Nagoya, and Nagoya is in many ways another Osaka. The city is located on the extensive Owari Plain at the head of Ise Bay with sufficient level land for factory expansion. It has good rail connections with all parts of Japan. It is one of the most densely populated districts of the country though the density per square mile is somewhat less than in either Osaka or Tokyo Prefectures.

Transportation Facilities

Nagoya is not as favorably situated as Osaka for transportation by water. Though the Owari Plain opens out upon Ise Bay, the city was originally about 4 miles from the sea. By the annexation of territory in 1907, 1910, and 1921 all of the intervening land has been included within the municipal boundaries and the city now has an outlet upon the water. The Nagoya harbor is much like the harbor of Osaka. The several streams emptying into the head of Ise Bay are building a delta, and their mouths and the bay itself are being filled with silt. It is only within recent years that the harbor has been improved to accommodate vessels drawing up to 25 feet. Because of this handicap and because of the late development of the port, Nagoya has not had the same commercial development as Kobe, Osaka, and Yokohama. It is of no importance as a port of call for the steamship lines connecting with foreign countries. Nagoya ranked fifth among the ports of Japan in 1927 in tons of shipping entering the harbor with only 2,600,000 tons in comparison with the 5,200,000 tons of Osaka in fourth place and the 7,200,000 tons of Moji in third place.[1] The total imports and exports of Nagoya are insignificant in comparison with the foreign trade of Yokohama, Kobe and Osaka. The imports of Nagoya were valued at $38,600,000 in 1927 and the exports at $25,900,000. Osaka, the smallest of the major ports, imported goods valued at $132,500,000 and exported goods valued at $181,600,000.[2]

The raw materials consumed in the factories of the Nagoya district and their finished products pass for the most part through ports other than Nagoya, especially through Kobe, Osaka, and Yokohama. For example, though Aichi Prefecture ranks second to Osaka in the number of cotton spindles and though Nagoya has more than two-thirds as many spindles as Osaka City, raw cotton only to the value of $5,800,000 was imported through Nagoya in 1927, and cotton yarn and cotton cloth only to the value of $7,600,000 were exported. For the same year, the raw cotton imports of Kobe were valued at $227,600,000 and of Osaka at $29,000,000, and the cotton yarn and cloth exports of the two cities at $77,500,000 and $121,000,000, respectively. Though Aichi Prefecture is the second most important prefecture of Japan in the production of raw silk, practically all of its raw silk is exported through the port of Yokohama.[3]

Not only is Nagoya handicapped by a relatively poor harbor and the inadequate steamship connections, but the facilities for water transport within the city are inferior to the waterways of Osaka. Nagoya does not have the network of canals possessed by that city and for the movement of goods between the city and the harbor a railway has been built to supplement the waterways.

The rather inferior facilities for water transport at Nagoya and the delay in their improvement have been instrumental in retarding the industrial growth of the Nagoya district. In the development of industries, transportation is a factor of vital significance and, following the opening of Japan, manufacturing industries first became important in those sections of the country with good water transport. Other districts, not so favorably situated, could only await the development of land transport, especially the building of railroads. At the present time, industrial development is probably progressing more rapidly in the Nagoya section than in any other part of Japan, but it is a development that could not begin until the railroads connecting the section with Osaka, Yokohama and the northern and central parts of the main island had been completed. Aichi Prefecture had only 28,000 cotton spindles in 1891, about 8 per cent of the total for the country, and ranked fifth among the prefectures. By 1920, the number of spindles had increased to 343,000 or over 9 per cent of the total, and the prefecture had risen in rank to fourth place. The advance of the next eight years was much more spectacular. In 1928, Aichi had 848,544 spindles, or over 13 per cent of the total, and was outranked only by Osaka Prefecture.[1] This growth in cotton spinning has been in line with the policy of the industry to spread to new centers where there is less competition for the labor supply providing that those centers possess ample level land for the building of factories and good transport for the bringing in of the raw cotton from the importing ports. Nagoya possessed all these qualities to a degree not equaled by any city of Japan with the exception of Osaka and perhaps Tokyo.

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1927.

[2] *Op. cit.*

[3] *Op. cit.*

The Textile Industries

The most important industry of the Nagoya district is the reeling of raw silk, Aichi Prefecture ranking second to Nagano in the value of product. If there were no other important industries in the section, the prefecture would have to be included in the raw silk district to which it is contiguous, but the reeling of silk is only one of many industries. The mulberry is grown and the silkworms reared in the more mountainous parts of the prefecture along the eastern border of the Owari Plain. Some of the cocoons are brought to Nagoya for reeling, and the others are reeled in the villages situated in the mountain valleys or at the edge of the plain. The industry is of comparatively recent growth, for Aichi Prefecture ranked thirteenth in the production of raw silk in 1883. Its present ranking in second place was not gained until 1910. The expansion of the industry was greatly stimulated by a government filature and experimental station established in Nagoya about 1890. Some of the early pioneers in the industry were trained in the government school at Tomioka in Gumma Prefecture.

The industry of second importance in number of workers in Aichi Prefecture is the weaving of cotton cloth. It is based upon an ancient household industry that produced cloth for use in Japan. The development of factories did not begin until 1888, and very little of the cloth was exported before 1905. The greatest growth in the industry has come during and since the World War. Even at the present time, however, the small establishment and the domestic workshop are the important producing units, the usual factory for export cloth having only 20 to 30 looms and for cloth to be used within the country about 10 looms. Many of the establishments have only 1 or 2 looms. In the Nagoya district alone, about 10,000 hand looms are still in operation. The principal centers of cotton weaving are Nagoya and Ichinomiya, immediately to the north, but in practically every village throughout Aichi the weaving of cotton cloth is carried on. Most of the cotton cloth intended for export is sent to wholesalers in Kobe or Osaka who dye and finish it.

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[1] Semiannual Report of Japan Cotton Spinners' Association, *op. cit.*

The industry of third importance, cotton spinning, has already been discussed. The weaving of woolen cloth and cloth of wool and cotton or artificial silk is another industry of some importance, Aichi Prefecture at present leading the country in the value of output though both Hyogo and Tokyo Prefectures have more workers in woolen factories. In Nagoya, woolen weaving is a factory industry, but in Ichinomiya it is done either in homes or in small weaving sheds with perhaps 10 or 15 looms. These four industries—silk reeling, cotton weaving, cotton spinning, and wool weaving—employ almost 60 per cent of the factory workers of Aichi Prefecture. The other industries are much smaller and include the brewing of sake and soy and the making of woodenware, matches, and pottery. The list includes no metallic industries. There is no refining of metals, no manufacture of hardware or machinery. All such products consumed in the district must be brought from Osaka or Tokyo. The absence of the metallic industries is a result of the relatively expensive transportation facilities, for though the raw materials for textile manufacture may be moved by rail without too great a burden of freight charges, iron and fuel are so bulky that the cheapness of the transportation is a major consideration. It is not likely that Aichi Prefecture, despite its rapid rise in industry, will experience much development in the metallic industries. To a greater extent than any of the major industrial sections of Japan, Aichi will continue to be important only for textiles, for other products consuming light raw materials, and for pottery.

The Pottery Industry

The pottery industry demands more extended consideration. In number of factory workers employed, it is not a major industry of Aichi, for in 1924 it employed only 9,400 of the 160,000 factory workers of the prefecture in comparison with 33,000 in silk reeling. The number of factory workers, however, does not show the true magnitude of the industry, for many of the establishments are so small that they are not included in the factory statistics. But such is also the case with silk reeling, and so the total of factory workers, though obviously incomplete, does give an indication of the relative importance of the two industries. Despite the minor importance of the pottery industry in comparison with the other industries of the prefecture, it is a significant industry, for Aichi is the center of pottery manufacture for Japan. In the prefecture are about one-half of the pottery workers of the country and they produce almost one-half of the value of the pottery products and 65 per cent of the pottery exports. It is in this section that most of the cheap Japanese ware sold in the United States is produced.

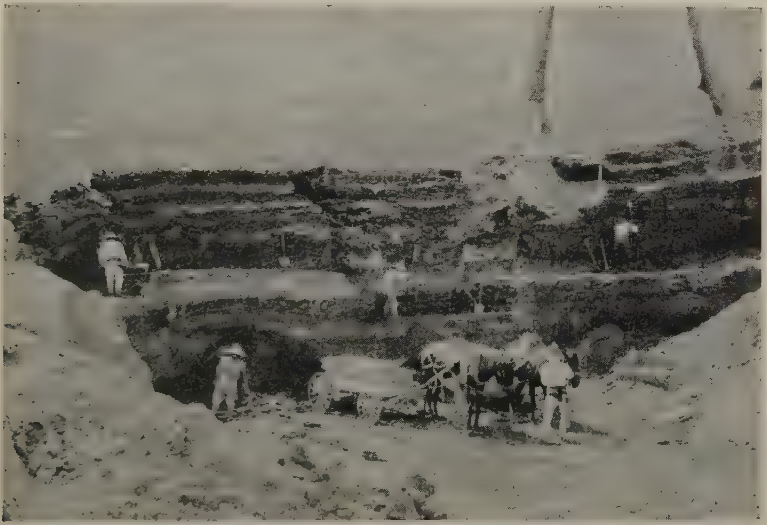

FIG. 53.—The kaolin deposit is situated a short distance from the Seto potteries. The clay is dug by hand.

The pottery industry is also significant because it is the first of the industries so far considered to be located by raw materials. The center of the industry is Seto, a small village about 10 miles from Nagoya, where there is a large deposit of kaolin estimated to contain a supply of clay sufficient for another 100 years at least. It is an ancient industry and was established some 700 years ago. During the following centuries and even during the feudal period, the industry was of little more than local significance because of the difficulty of transporting the bulky and fragile product. Since the opening of the country and the improvements in transportation, the industry has experienced a great expansion both for the export trade and to meet the demands within the country. The ware is not of high quality and quantity production is emphasized.

The deposit of kaolin was the property of the local daimyo during the feudal period, but with the restoration of the Emperor to power in 1868 it passed into the hands of the prefectural government. For a time, it was exploited by the manufacturers on lease and with the payment of a royalty for the material removed. Since 1899, the kaolin has been extracted by the Seto Tojiki-kosho Domgyo Kumiai, or the Seto Pottery Manufacturers' Trade Association, and sold by the Association to the manufacturers at a price sufficient to cover costs of production and the royalty to the prefectural government. The kaolin used in Seto is all produced within 4 miles of the potteries and the inferior clay for the saggers comes from a deposit about 2 miles away. The mining methods are very simple. The six mines of the Association employ only about 80 workers. In one of the six visited in 1926, 27 men, mostly Koreans, were hacking down the kaolin with picks and bars and shoveling it into horse-drawn carts to be carried to the potteries.

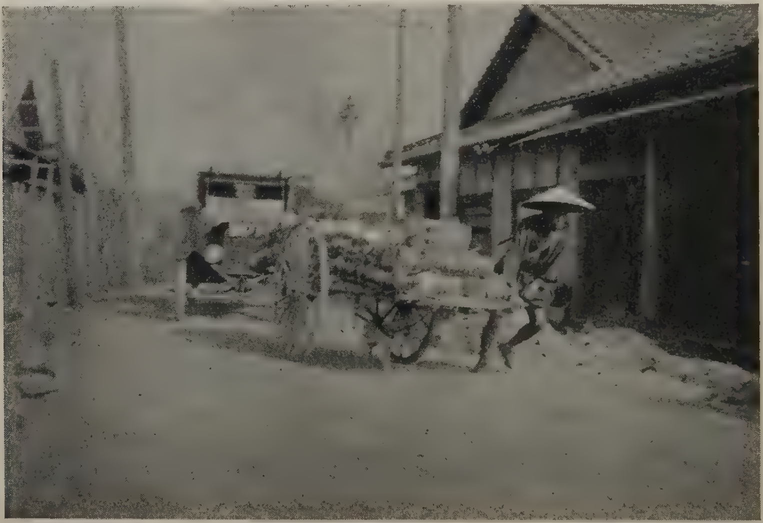

FIG. 54.—Pottery is transported the 10 miles from Seto to the Nagoya market by man-drawn carts. The modern motor truck has come into use only recently.

The coal for the kilns is brought in from Kyushu, Manchuria, and Hokkaido. The finished products are marketed chiefly through Nagoya and are carried to that city, about 10 miles away, by electric tramway, by motor truck, and still to a very considerable extent by carts drawn by man.

Minor Centers of the Nagoya Area

The prefecture of Mie bears much the same relation to the Nagoya-Gifu district that Wakayama does to the Osaka-Kobe-Kyoto district. It is an outlier adjoining Aichi Prefecture on the south. It has no great industrial center, but in Yokkaichi and in other towns along the railroad there are located some factories. Of the 40,000 factory workers in the prefecture, almost 75 per cent are employed in the three textile industries, cotton spinning, cotton weaving, and silk reeling.

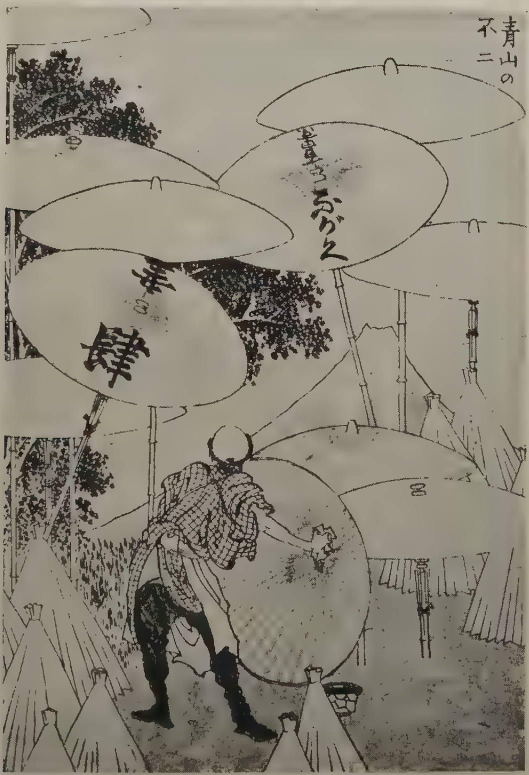

FIG. 55.—Umbrellas spread in the yards to dry have been a common sight in Gifu for centuries. (*From an early nineteenth century print by Hokusai in the collection of the New York Public Library.*)

Gifu Prefecture, the prefecture immediately to the north of Aichi, has been included in the raw silk producing district. The prefecture is a large one and most of its area lies in the very mountainous section of central Honshiu. There is little level land for the growth of large cities, and transportation is so limited that only products of high value can be marketed economically. The land is suitable for the cultivation of the mulberry, and the reeling of raw silk has become the principal industry.

The southern part of the prefecture is not mountainous. It extends into the Owari Plain, and across it runs the Tokaido Railway, the main line from Tokyo to Kobe. Gifu City is situated in the level part of the prefecture only 17 miles from Nagoya and should be included in the Nagoya industrial center. The leading factory industries are all textile industries—the spinning of cotton, wool, and silk yarn, and the weaving of wool cloth and of wool mixed with cotton.

Gifu City is also important for two purely Japanese industries still untouched by western influences. It is the center for the making of paper umbrellas and lanterns. Both are made in other parts of Japan, but Gifu leads both in total output and in quality. They are ancient industries. According to tradition, the making of umbrellas was started about 1632 in the early years of the Tokugawa shoguns by the followers of the impecunious daimyo of the district. The making of lanterns was started at about the same period to provide the palace lanterns which served as gifts to the shogun. Both industries have expanded considerably since the railroad reached Gifu in 1877, and since 1900 there has been some export of the two products, chiefly to other Asiatic countries. Even at the present time the industry is not a factory industry. All of the lanterns and the umbrellas are made in the homes of the workers for the wholesalers. The organization of these two industries will be presented in detail in a later chapter.

THE NORTHERN KYUSHU INDUSTRIAL CENTER

At the western end of the Tokyo-Nagasaki industrial strip is the fourth and last nodal center, the manufacturing district of northern Kyushu and of southern Yamaguchi across the Straits of Shimonoseki. It is a district less significant, perhaps, for its present development than for its promise for the future. Though no other section of Japan has had contact with the West extending over so long a period, its industrial development is very recent, little of it going back more than 30 years and much of it dating only from the World War. It was on Hiratoshima, an island close by, that the Portuguese established their first trading station in the middle of the sixteenth century, and the Dutch a station in 1609. Later, the Portuguese were expelled, and in 1641 the Dutch station was moved to Deshima Island, Nagasaki, where it could be more closely supervised by the Japanese. Almost the only contact of Japan with the outside world until 1853 was through the Deshima station. This intercourse with the West might be expected to lead to an early industrial development, but the trade was too limited and too circumscribed by official regulations. When industrialization did begin, this region was considered too remote from the principal centers of Japan—Tokyo, Kyoto, and Osaka—and little attention was given to it by the government in their early efforts to encourage the development of the new industries.

Such neglect is difficult to understand if one considers that the new industrial system that was being introduced differed from the old Japanese industry principally in the substitution of mechanical power for human labor. At that time in the other industrial countries, coal was almost the sole source of mechanical power, and in Japan the only coal producing area was in this section of northern Kyushu. The first industries to be established in Japan, however, were the textile industries consuming little power. A supply of coal was less essential than location near labor and markets. It is true that some attention was given to shipbuilding even before the country was opened. In this industry the advantages of the Kyushu district were apparent and two shipyards were established at Nagasaki.

At about the time of the war with China in 1895, Japan realized the need of an iron and steel industry. Government funds were provided for the building of a large plant, and Yawata in northern Kyushu was selected as the site because of the coal deposits in the area and because of its nearness to the Asiatic continent from which it was proposed to bring the iron ore. It was the beginning of an industrial expansion, for the steel plant attracted other industries and the narrow coastal strip from Orio to Moji is now the outstanding center of Japan for heavy manufactures. In the northern Kyushu industrial district, there were in privately owned factories in 1924, 97,000 workers. Of that number, 30.2 per cent were employed in the heavy metallic industries as compared with 19.6 per cent in the Osaka-Kobe-Kyoto district and 19.1 per cent for all of Japan. A very important part of the metallic manufacturing of the Kyushu district is in the hands of the government, and the number of workers in the government factories is not included in the prefectural statistics. It has been possible to ascertain only the number employed in the government steel works at Yawata and if it is included with the privately owned factories, 42.2 per cent of the factory workers of the area are in metallic industries. It is probable that if other government plants could be included also it would be found that at least one-half of the factory workers are employed in the refining of metals and in the manufacture of tools, machines, and other iron and steel products.

Advantages for Manufacturing

The principal industrial advantage of the area is its possession of important coal deposits. They explain the predominance of the heavy industries. In northern Kyushu are located 37 per cent of the estimated actual and probable coal reserves of Japan.[1] At present, the Kyushu deposits have been developed to a much greater extent than the other deposits of Japan and produce 67 per cent of the total coal output of the country. The most important field is in the Chikuho district opening out directly upon the Moji-Orio industrial area and the field of second importance, including the largest coal mine of the country, is at Omuta about 90 miles to the south. Some coal is mined near Nagasaki. It is from northern Kyushu that Osaka, Nagoya, Tokyo, Kobe, and the other industrial cities of southern and eastern Japan obtain most of their fuel.

Two other advantages of the northern Kyushu area are the abundance of harbors and the proximity to China, Manchuria, and Korea. Water transport is essential to this district since both the raw materials and the finished products of the principal industries are bulky commodities that demand cheap transportation. The harbors are small but they are adequate for the vessels plying across the Japan Sea to the Asiatic mainland. Most of the foreign trade of the district is with Asia. In 1927, 76 per cent of the total foreign trade of the three principal ports—Moji, Nagasaki, and Wakamatsu—was with Asia, distributed as follows: 28 per cent with China, 14 per cent with Kwantung Leased Territory, and 34 per cent with the other Asiatic countries.[2] The ready access to the Asiatic mainland is of especial importance in view of the almost total absence of iron ore in Japan and the dependence of the iron and steel industry upon imports of ore from China, Manchuria, and Korea. The position is not of so great significance in the export trade, for the manufactured products of the district are consumed mostly in Japan. The exports of the three principal ports totaled only $29,500,000 in 1927, and the imports $69,400,000.[3]

The area has some disadvantages and the principal one is a disadvantage that has already been emphasized in the description of other industrial centers. Northern Kyushu is a region of rugged topography and the factories are confined for the most part to the narrow shelf between the mountain slopes and the sea. So scarce is level land that at the Imperial Steel Works it has been necessary to reclaim land from the sea to provide storage space for coal, iron ore, and other materials. The industrial towns are narrow ribbon towns stretching along the sea for miles but with no great width.

The region is also located inconveniently for the consuming markets of Japan. The centers of population and of great industrial development are over 300 miles to the east. Despite all these handicaps, however, the area seems destined to become one of the leading industrial areas of Japan, for its facilities for the iron and steel industry, deficient as they are, are vastly superior to the facilities of any other section of the country. It is probable that more and more of the industries dependent upon fuel and heavy raw materials will shift to northern Kyushu.

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[1] Twelfth International Geological Congress, The Coal Resources of the World, Toronto, 1913.

[2] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1927.

[3] *Op. cit.*

The Principal Manufacturing Industries

The prefectures included within the northern Kyushu industrial area are Fukuoka, by far the most important, Saga, Nagasaki, and Yamaguchi. The list of the important manufacturing industries presents a marked contrast to the industries of other sections of the country. It includes the refining of metals, the making of hardware, electrical apparatus, glass, chinaware, and cement, the brewing of sake, and shipbuilding. Another very significant industry is the mining of coal. The textile industries, all-important in other sections, are relatively insignificant. Of the total number of workers in private factories in northern Kyushu, only 23.6 per cent were employed in textile industries in 1924. In the Osaka-Kobe-Kyoto area, 47.8 per cent and in all of Japan about 50 per cent of the factory workers are engaged in the textile industries.

Because of the nature of its industries, the northern Kyushu district has in its outward appearance little in common with the other industrial sections of Japan. Where the textile industries are the predominant and almost the only industries, the evidences of industrialization are often softened and to a large extent concealed by Japanese architecture and by flower gardens, even if the reeling or the spinning or the weaving is being done in factories. It is impossible, however, to hide blast furnaces and steel mills, cement mills, glass factories, and sugar refineries behind dwarf trees. They put their indelible mark upon the landscape. There can be no question of the industrial character of northern Kyushu. It is a district of ungainly buildings, tall chimneys, black smoke, refuse heaps, piles of coal and iron ore, railroad tracks, docks, of grime and noise and ugliness.

There are in northern Kyushu some textile industries, but they are completely submerged in magnitude and in national importance by the heavy industries. They are to be found in the villages and in larger centers away from the coasts. All of the prefectures included produce a little raw silk and cotton cloth. In Kurume, Nagasaki City, Saga City, and Omuta there are cotton spinning mills, but in all of the prefectures combined there were in 1928 only 260,000 spindles, fewer than half the number in Osaka City. Hakata, in Fukuoka Prefecture, is famous for a hand-woven silk cloth widely used for obi, neckties and waistcoats. The industry is very old, perhaps 600 years old, and is still carried on only in small establishments.

One enterprising industrial concern a few years ago built a spinning mill of over 40,000 spindles in the midst of the steel mills, in the hope of making use of the labor of the women and children of the families of the steel workers. But the company reckoned without the Japanese women who have continued to work with their husbands in the steel mills, preferring the higher wage even with the heavier work to the lower wages offered in the spinning mill. The labor for the new mill has had to be recruited from other districts. There seems to be little prospect in the immediate future, at least, of the development of any industrial symbiosis comparable to the present parasitic expansion of silk weaving into the anthracite regions of Pennsylvania.

The Imperial Steel Works

The most spectacular industry of northern Kyushu is the Imperial Steel Works located at Yawata. The first unit was completed in 1901, and since 1910 two other mills have been added. At the present time, the buildings cover about 450 acres and the surrounding yards include an additional 1,200 acres. The plant employs over 20,000 workers, mostly men. It is a government plant erected under German supervision. All of the equipment was imported from Germany and the plant is said to be modeled after the Krupp Works at Essen. Before construction began, several of the Japanese who were later to become responsible officials in the plant studied in Germany and in America. During the first few years of the operation of the plant, the Japanese were assisted by a German metallurgical engineer and in each department there were two German specialists and a German foreman.

The equipment of the steel works includes six blast furnaces ranging in capacity from 250 to 400 tons per 24 hours. All of the pig iron is consumed in the steel plant and additional pig iron must be imported from China and Manchuria. There were in the steel plant in 1926, at the time of my visit, two 10-ton Bessemer converters, two 200-ton Talbot furnaces, and 29 open-hearth furnaces ranging in capacity from 25 to 60 tons. I was told by one of the officials that the annual capacity of the plant was then 500,000 tons of pig iron, 950,000 tons of crude steel, and 750,000 tons of steel products. There has been some increase in capacity and output since 1926. By government regulation, the Imperial Steel Works is not permitted to dispose of any of the pig iron or crude steel and can sell only the finished and semi-finished products, such as rails, bars, plates, rods, wire, nails, tin and galvanized plates, and special steels. It is from the Imperial Steel Works that most of the hardware and machine manufacturers of Japan secure their raw materials.

The Imperial Steel Works is probably as well located with reference to its raw materials as would be possible in any part of Japan. The plant produces its own coke, most of the coal coming by rail from the nearby Chikuho field. The Japanese coal will not coke alone and with it must be mixed coal from near Tientsin, China. The limestone is quarried near Moji, perhaps 10 miles distant. The bulk of the iron ore comes from the deposits of the Yangtze Valley in central China. For mixing, and during periods when the Chinese supply is cut off, some ore is also imported from Johore in the Malay Peninsula and from Australia. Both the coal and the iron ore are unloaded directly from the ships to the storage yard of the steel plant. The manganese is obtained from south China and from British India, and the nickel from French New Caledonia. Most of the other necessary alloys are mined in Japan.

At Tobata, a short distance from the Imperial Steel Works, there are two other steel plants, privately owned. One was constructed as a result of the war boom and was completed in 1923; but it was not brought into operation due to the slump in prices. It was intended that it would utilize pig iron imported from China. There is another small privately owned steel mill near Moji. In later chapters, the accomplishments and the probable developments of the Imperial Steel Works and of the Japanese iron and steel industry in general will be analyzed in considerable detail.

Other Industries of the Kyushu Center

On the narrow strip of land stretching for 20 miles along the sea from Moji to Orio, there are many other heavy industries. At Moji, in addition to the steel mill, there is a flour mill, a brewery, a sugar refinery, a wire rope mill, a copper wire drawing mill, and a pottery. At Kokura, there is a government arsenal. At Tobata, there is a glass works, a vegetable oil plant, a coking plant, a factory manufacturing electrical apparatus, and the two steel mills already mentioned. The prefecture of Fukuoka, of which the Moji-Orio strip is a part, ranks first among the prefectures of Japan in the primary metal industries, second in the brewing of sake, third in the manufacture of glass and chinaware, fourth in the manufacture of hardware, and seventh in the manufacture of electrical apparatus. In the more usual industries of Japan—the industries of the textile group—the prefecture is of no great national importance, though it is true that more workers are employed in cotton weaving and spinning than in some of the heavy industries.

The prefecture of Saga, adjacent to Fukuoka on the west, ranks second to Aichi Prefecture in the manufacture of china and crockery, but it employs only one-fourth as many workers in establishments included under the factory law. The ceramic industry is even more predominantly a domestic industry in Saga than it is in Aichi. The centers of the industry are Arita, Takeo, Imari, and Mikawachi. The industry is not as old as the industry of Seto, but it does date back at least to the beginning of the sixteenth century. The clay is found in the hills to the east of Arita. It is of excellent quality and some of it is even sent to Aichi Prefecture where it is used in the manufacture of the higher grade wares. The product of the Saga centers is for the most part of high quality and is usually known in trade as Hizen ware, from the old name of the province. It includes the fragile egg-shell porcelains, crackleware, and ware decorated in beautiful enamels.

Nagasaki Prefecture to the west and south of Saga is important chiefly for shipbuilding. It is surpassed only by Hyogo Prefecture. The principal establishment, the Mitsubishi shipyard, is one of the oldest in Japan and was built by the shogunate in 1857. It is at present the largest shipyard in the country. In 1898, it launched the first large steamship built in Japan, the *Hitachi Maru*, a vessel of 6,000 tons. The Mitsubishi shipyard was built long before the industrial development of northern Kyushu, and at first all materials had to be imported. Through its proximity to the centers manufacturing plates and other ship steel, it now has an advantage over the other shipyards of Japan. Almost one-half of the factory workers of Nagasaki Prefecture are engaged in shipbuilding. Another industry of importance is the manufacture of munitions. There is some cotton spinning.

The port of Nagasaki has declined greatly in importance in recent years. It was the third most important port of Japan until 1900, but in that year it was surpassed by Osaka and it has since been surpassed by Moji, Wakamatsu, Yokkaichi, and Nagoya. Its decline has been due especially to the growth of industry in the district of northern Kyushu served by the ports of Moji and Wakamatsu on the Straits of Shimonoseki. Many of the steamship lines that formerly made Nagasaki a port of call now stop at Moji instead. The Russo-Japanese War greatly stimulated the growth of the area on the Straits, but it brought a severe loss to Nagasaki. Previously, Nagasaki had been the winter quarters for the Russian Asiatic fleet. The men and their families brought a great deal of wealth to the city.

Nagasaki is taking on the appearance of a deserted village. It is rarely visited by tourists, except for the few hours that their ship may be in port, and the largest foreign-style hotel has been demolished recently for want of custom. For the present, at least, western progress is passing by this port that was for centuries Japan's only link with the rest of the world. It does seem, however, that the present situation should be only temporary. Nagasaki has an excellent harbor. It is one of the most conveniently located of the ports of Japan for trade with China, especially with south China. It is not a great distance from the iron and steel district of northern Kyushu. It does not possess an industrial hinterland, however, and its future will depend entirely upon the industrial progress made by its tributary areas.

Yamaguchi Prefecture, the Land's End of Honshiu, lies immediately across the Straits of Shimonoseki from northern Kyushu and is included in that industrial district though it is not of any great importance in industry. The industries along the coast near Shimonoseki resemble those of the Moji-Orio stretch in character though they are not as large. They include shipbuilding, the making of cement and lime, the brewing of sake, and the manufacture of fertilizer. There is some cotton weaving and silk reeling scattered throughout the prefecture, but it is scarcely of more than local significance.

The northern Kyushu district may be said to hold the key to Japan's industrial future. In modern times, no nation has ever attained a position of first rank in manufacturing unless it has succeeded in establishing the manufacture of iron and steel as a basic industry. England, Germany, the United States are all great producers of iron and steel. France, Italy, and the Scandinavian countries have lagged industrially because of their poverty, either of coal or of iron ore, and because of their resulting backwardness in the manufacture of iron and steel. Northern Kyushu is one of the few sections of Japan to possess at all favorable conditions for the heavy metal industry. It is upon this section that Japan must depend very largely for this all important industry and for that reason upon the industrial progress of northern Kyushu may be said to rest the industrial future of Japan.

THE MINOR MANUFACTURING REGIONS OF JAPAN

There remain to be discussed the minor manufacturing regions of Japan. They may be gathered into three groups, the first including what might be termed the connecting links between the four major nodal centers on the Tokyo-Nagasaki industrial strip, the second the industrial areas on the eastern and western coasts of Honshiu, and the third the island of Hokkaido. The minor regions of the first group have many of the advantages for manufacturing possessed by the adjacent major centers, but they lack some essential condition that has contributed to the nodality of the latter. They have access to the sea, but they do not have good harbors. They perhaps have a labor supply, but they possess no area of plains upon which their factories and their cities can expand.

Shizuoka

The first of these minor regions is Shizuoka Prefecture serving as a connecting link between the Tokyo and Nagoya centers. It is a large and rather mountainous prefecture. Its factories employ 49,000 workers. It has a wide variety of industries, probably the most important of which is the growing and curing of tea. Much of the land of the prefecture is too rugged for the cultivation of rice, but it is well suited to tea culture. It slopes southward toward the sea and receives abundant rainfall from the moisture laden winds of the summer monsoon. During the winter, the temperatures are moderated by the proximity of the ocean, and there is little danger of damage to the plants by frost. Most of the production of tea is confined to a narrow strip of steeply sloping land running parallel to the coast southwestward from the city of Shizuoka which is the marketing center.

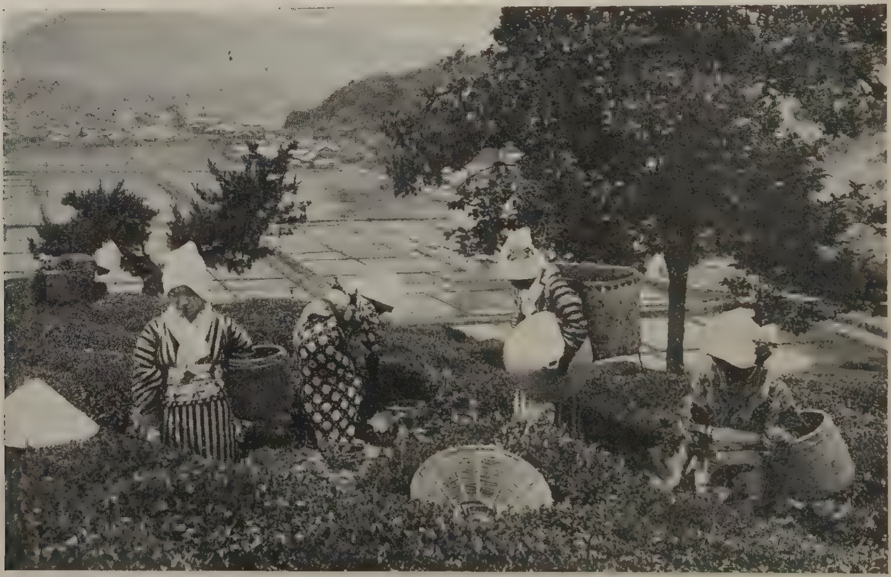

FIG. 56.—The slopes of mountainous Shizuoka are planted in tea. The plains are in rice. (*Courtesy of The Fuji Company, Ltd.*)

Shizuoka is easily the leading tea producer of Japan. The prefecture produced 48 per cent of the output of the country in 1925 and exported over 90 per cent of the total tea exports. The industry has become important only since the opening of Japan to foreign trade. Previously, tea was grown in Shizuoka just as it was in many other parts of Japan, but the industry was of no particular significance. Foreign trade provided a market and to meet the new demand the cultivation of tea was greatly increased, especially in Shizuoka, the area most conveniently located to the exporting ports.

Though tea is probably the most important product of Shizuoka, its preparation does not rank high as a factory industry. It is still largely a household industry. The first firing of the leaves is done either by the farmer who has produced them or in a small factory situated in the midst of the tea fields. The managing director of the Shizuoka Prefecture Tea Association estimated in 1926 that there were in the prefecture 5,000 farmers using machinery in the preparation of tea and many more than that curing tea without machinery. The tea is refired, graded, and packed in the warehouses of the exporters in Shizuoka City. These establishments are larger than those in which the first firing is done, but no complicated machinery is required and the labor force is not large. There were in the prefecture, in 1924, 35,000 producers of tea,[1] but only 2,700 workers were employed in establishments large enough to be included in the report of factories.[2] Prefectural data are not available for later years, but on the basis of the data for all of Japan it seems probable that the number of workers in tea factories in Shizuoka Prefecture is at present even less than it was in 1924.

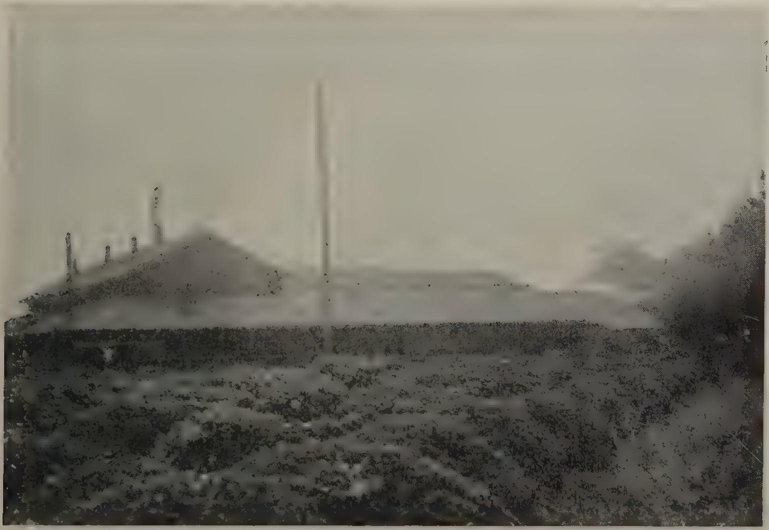

FIG. 57.—A tea factory situated in the midst of the tea fields of Shizuoka.

Shizuoka Prefecture has the land for a considerable increase of its tea production, but the output is limited by the market. In recent years,

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[1] Statistics of Agriculture and Forestry (in Japanese), *op. cit.*, 1924.

[2] Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

Ceylon, India, Java and Sumatra have become serious competitors of Japan in the tea trade. They have the advantage of cheaper labor and of a longer growing season. In Ceylon, the tea may be picked every 10 days throughout the year. In Japan, only four crops are obtained and the last is rather poor.

According to the factory report, the most important single manufacturing industry of Shizuoka Prefecture is the weaving of cotton cloth, and in number of workers employed the prefecture ranks second to Osaka. As in the other parts of Japan, there is little concentration of the industry either in large establishments or in one locality. It is scattered through the prefecture in small workshops and in homes. Hamamatsu, a town on the Tokaido Railway, is the one important center of cloth manufacture. The industry dates back to feudal days when the cotton was raised in the surrounding agricultural area. Even in Hamamatsu there are only three or four factories of any size, the largest having 272 looms. Most of the cloth is still the product of small weaving establishments. An official of the Totomi Cloth Trade Association stated in 1926 that there were in the Hamamatsu district more than 1,000 weavers with only one or two looms.

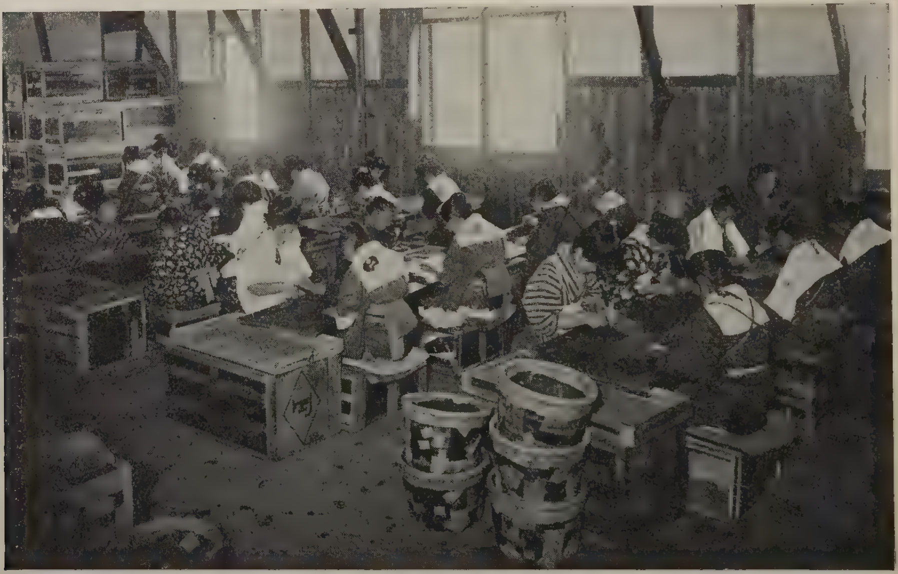

FIG. 58.—Cleaning the tea. Many of the operations in the most modern tea factory are done by hand. (*Courtesy of The Fuji Company, Ltd.*)

Silk reeling is the industry of next importance but, in comparison with the prefectures in the central part of Honshiu, the industry in Shizuoka is of no significance. The prefecture occupies a position of importance in the manufacture of timber and timber products. It is the leading prefecture in the manufacture of paper pulp and paper, the timber coming originally from the mountainous sections of the prefecture. At present, much of it is brought in by sea from Hokkaido, Sakhalin, or Korea and unloaded at Shimizu. The paper mills are located at Fuji on the Fuji River, at Fujieda, and at Shimada. Box shooks for the tea chests are made at Shimada. In Shizuoka City, bamboo ware, lacquer ware, and small wooden articles are made. The other industries of the prefecture are cotton spinning, dyeing and bleaching, the weaving of woolen cloth, and silk spinning.

Between Osaka and Shimonoseki, there are three minor manufacturing centers—Ehime, Okayama, and Hiroshima. Ehime is the prefecture on the western side of the island of Shikoku. Its principal city is Matsuyama. The prefecture is important chiefly for the textile industries—cotton spinning, cotton weaving, and silk reeling. Okayama and Hiroshima are located on the south shore of Honshiu on the Inland Sea. In addition to cotton spinning and weaving, these two prefectures have some shipbuilding, hardware manufacturing, and brewing.

East and West Coasts of Honshiu

The second group of minor manufacturing regions includes the prefectures of Fukui, Ishikawa, and Niigata on the western coast of Honshiu and Iwate Prefecture on the east coast. They have the coastal location of the Tokyo-Nagasaki strip, but they have few harbors and are off the path of ocean transport. They are not well located for the import of raw materials or for the export of finished products. Their industries are limited to the production of goods from Japanese raw materials and for Japanese consumption. Fukui is the leading prefecture of the country in the manufacture of silk cloth, especially of habutae. Ishikawa ranks second and Niigata fifth. This industry employs very nearly one-half of the factory workers of the three prefectures on the west coast. The other industries are also textile industries— cotton weaving, cotton spinning, and silk reeling. This section has experienced industrialization only to a slight degree. The industries are survivals of the feudal period and are still carried on in very much the same way that they were then. Establishments are small and hand looms are used in weaving.

Iwate Prefecture on the east coast of Honshiu is of relatively slight significance in manufacture, but within its borders is located one of the few deposits of iron ore in Japan. Near the Kamaishi mine, there has developed a small iron and steel industry which supplies the Tokyo market in part. The history of the Kamaishi plant has been presented in an earlier chapter and in a later chapter its future possibilities will be analyzed. There is no other manufacturing industry in Iwate Prefecture with the exception of a little silk reeling.

Hokkaido

The third of the minor industrial regions is the island of Hokkaido. It is a scantily populated frontier region and its development has been largely agricultural. Any importance that it may have in manufacturing is due to its large size and to its possession of raw materials. Hokkaido has extensive forests and rich deposits of coal. The industries that have developed are of the type that depend very closely upon raw materials. Hokkaido leads in lumbering and is important in the manufacture of paper and paper pulp, in the primary refining of metals, in the canning of fish, and in brewing.

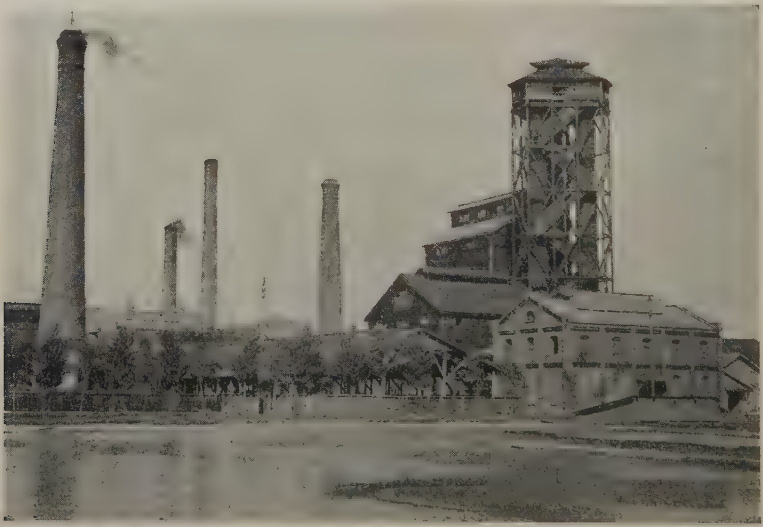

FIG. 59.—One of the largest paper mills of Japan, the Fuji Paper Company at Ebetsu, Hokkaido.

Most of the industries, with the exception of the actual mining of coal or the felling of the trees, are located either along the railroad which crosses the Ishikari Plain and connects the principal cities of Sapporo and Otaru, or at the ports on the southern coast. Sapporo is the center for the brewing of beer, the spinning and weaving of flax, and the spinning of hemp yarn. The barley for the beer, and the flax and hemp are all raised on the plain surrounding Sapporo. A part of the hops is raised locally and a part is imported from Germany. The brewing of sake and shoyu, purely Japanese industries, is carried on in every urban center, either as a domestic industry or on a very small scale.

At Muroran, on the south coast, there is located a successful iron and steel plant using iron ore and coal from Hokkaido, and a factory for the manufacture of farm implements. In the cities in the farm areas, the making of the smaller farm implements is a domestic industry. At Hakodate, also on the south coast, there is a cement plant and a factory for the weaving of cloth and the making of fish nets from hemp yarn. The making of starch from the potato is a by-occupation of the farmers especially near Asahikawa and Kutchan. Splints for the match industry of Kobe are made around Kushiro. At Yamuwaka, there is a tannery utilizing oak bark, and at Otaru wheat, most of it imported from America, is made into flour.

This concludes the survey of Japan's industries and industrial centers. It will be seen that the country has made considerable progress in industrialization and that in the southern part, at least, there are factory centers. In the following chapters there will be an analysis both of the degree of the industrialization so far accomplished and of the potentialities of Japan as a manufacturing nation.

CHAPTER XI

THE MEASURE OF INDUSTRIALIZATION

INDUSTRIALIZATION has been in progress in Japan for 75 years. It has been encouraged and assisted by the government in a generous and energetic fashion. Many manufacturing industries have been established and the industrial centers, discussed in the previous chapters, have been developed. But Japan is no England of the Orient though that comparison has become a popular one in western countries. The industrial sections comprise only a very limited part of the country, and even within their boundaries manufacturing may assume an importance far beyond its true position, for modern industry so impresses itself upon the landscape and its strength is so visible that it may conceal other more modest, but more significant activities of man. The growth of manufacturing in Japan is remarkable only if comparison is made with other Asiatic countries or with the Japan of the middle of the nineteenth century. It is a far cry from the small workshop of the feudal period, with its artisans producing wares largely for local consumption, to the factory-lined canals and grimy atmosphere of modern Osaka. The contrast is so marked that in the effort to emphasize the changes that have been accomplished since 1850 there is the temptation to exaggerate the actual extent of the present industrial structure and to neglect the analysis of the soundness of its growth.

THE IMPORTANCE OF AGRICULTURE

In the European or American sense, Japan, today, is not an industrial nation. The country remains, as it always has been, essentially agricultural. In the census year 1925, between 50 and 55 per cent of the population were dependent on agriculture.[1] Among the leading nations, only Italy and Russia are so completely dependent upon the land. Data are not available for Russia, but it is probable that approximately 60 per cent of the people are in agriculture. In Italy, 56 per cent of the population are engaged in agriculture, almost the same proportion as in Japan. In the other nations, the percentage is much smaller,—7 per cent in Great Britain, 26 per cent in the United States, 31 per cent in

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[1] Estimated on the basis of the number of households engaged in agriculture and the population per household. Data from Japan, Department of Agriculture and Forestry, Statistics of Agriculture, Farmers (in Japanese), 1925 and 1926.

Germany, and 42 per cent in France.[1] Even in such countries as Denmark, the Netherlands, Canada, Australia, and Argentina—all recognized as agricultural lands—agriculture is relatively of less importance than it is in Japan.

It is difficult to make any comparisons between the value of product of agriculture and of manufacturing, for in manufacturing, especially, there are so many duplications due to the fact that the finished product of one industry becomes the raw material of another. The most important manufactured products of Japan, however, are two primary commodities, raw silk and cotton yarn. For the five-year period 1924 to 1928, their combined value averaged only 56 per cent of the combined value of rice and cocoons, the two leading agricultural products.[2] Even this comparison must be qualified, for the major part of the value of both the raw silk and the cotton yarn—in the case of raw silk, 70 per cent—is due to the value of the raw material, in both cases an agricultural product. The comparison does indicate, however, that agriculture occupies the leading position in Japan not only in the employment of the population but in the total economic income.

The persistence of agriculture as the basic occupation is all the more remarkable in view of the fact that Japan is a rugged land with an arable area limited to approximately 16 per cent of the total. The density of population for the entire country is about 420 per square mile, but if the arable area alone is considered it is 2,500 per square mile. If only the agricultural population is considered, the density is 1,375 per square mile, giving each member of each rural family, on the average, a little less than ½ acre of arable land. Of the countries with which comparison has been made above, all have vastly superior resources for agriculture. Italy alone resembles Japan in the ruggedness of its topography, and of its area 42 per cent is classified as arable.[3] The tenacity with which the Japanese people have clung to the land and their reluctance to shift to other occupations cannot be explained by any abundance or richness of the agricultural resources.

THE INCREASE IN NUMBER OF FACTORY WORKERS

In an earlier chapter, it has been pointed out that the population of Japan has doubled since about 1850. In a land already filled practically to the saturation point, only a small part of this increase has found employment on the farms. The remainder has been diverted into other occupations, but though much stress has been laid upon industrialization, modern manufacturing industry has absorbed a relatively small portion. Including the office staff, engineers, foremen, operatives, and casual labor, there were 2,144,000 persons employed in factories with five or more workers in 1928.[1] If comparison is made with 1850 or 1860, the number indicates a remarkable increase, for there were in those years practically no factory workers. The number is even remarkable in the fact that it has doubled since 1909, but it loses much of its significance in comparison with the present population. Allowing even five dependents to each factory worker—a ratio much too high since about half of the factory workers are women and about 15 per cent are under sixteen years of age—it will be seen that only a little over 10,500,000 people, or approximately one-sixth of the population, are supported by factory labor. If only three persons are estimated as the dependent family of each factory worker, only one-tenth of the population is supported by factories. The latter figure probably much more closely approximates the true condition than the former.

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[1] League of Nations, Economic and Financial Section, International Statistical Year-Book, Geneva, 1928.

[2] Values as reported by the Japanese government departments in Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928, and Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

[3] Italy, Istituto Centrale di Statistica, Annuario Statistico Italiano, 1926.

The rate of increase in the number of factory workers has by no means kept pace with the increase in total population. In 1894, the first year for which factory statistics are available, there were 381,000 operatives in factories employing more than 10 workers.[2] By 1928, the number exclusive of office staff, foremen, engineers, and casual labor, had increased to 1,936,000.[3] This number is not exactly comparable with the earlier figure, for in 1921 the definition of a factory was amended to include the establishments employing from 5 to 10 workers. The factory reports for the recent years have included approximately 23,000 factories and 155,000 workers that would not have been included under the previous definition, and for that reason they exaggerate somewhat the increase that has occurred in the number of factory workers.[4] If the 1928 figures are adjusted to make them comparable with the returns for 1894, the increase in the number of factory workers has averaged only 41,000 per year in the 34-year period. For the same period, the average annual increase in the population has been 654,000. It would seem that the factory industries have provided direct support for probably about 20 per cent, and certainly for not more than 30 per cent, of the annual increase of the population.[5]

In recent years, when the growth in the population has been greatly accelerated, the progress of industrialization has been especially unsatisfactory. Industry was greatly stimulated by the World War, and the number of workers in factories increased from 1,200,000 in 1914 to over 2,000,000 in 1921. Then came the postwar depression with its contraction of industry. The 1921 figure was not equaled again until 1926, and the increase for 1928 over 1921 was only 115,000, but in that seven-year period the total population had increased by about 5,500,000. According to the Home Office, the number of factory workers in 1929 was less than the number in 1928 by 20,000.[1]

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[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

[2] Financial and Economic Annual of Japan, *op. cit.*, 1902.

[3] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

[4] Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

[5] This range depends upon number of persons estimated to be dependent on each wage earner.

THE SMALL SIZE OF THE INDUSTRIAL ESTABLISHMENTS

One of the distinguishing features of the modern industrial system is the growth of the factory and the replacement of the small domestic workshops by larger and larger establishments. In Japan, however, manufacturing is still the activity of the small workshop much as it was in the period before the opening of the country. According to one estimate, 5,278,000 persons were engaged in manufacturing in 1920. Since only 1,979,000 workers were employed in the establishments included in the statistics of factories, it would seem, if the estimate is accepted, that 3,200,000, or 60 per cent of the persons in manufacturing, were in establishments with fewer than 5 workers.[2]

The larger factory is the exception and in only two groups of industries has it become the dominant unit of production. Because of the nature of their processes and because economic operation is possible only with comparatively large units, the spinning of cotton yarn and the manufacture of heavy iron and steel products have disappeared as domestic industries. They are carried on exclusively in factories on a fairly large scale. In the spinning of cotton yarn over 95 per cent of the workers, in shipbuilding 91 per cent, and in the primary metal industries 73 per cent are employed in establishments with more than 500 operatives.[3]

It was in the spinning of cotton yarn and the manufacture of iron and steel that the European Industrial Revolution was most complete, and it is in those two industries that the greatest changes have occurred in Japan. Both, as they now exist in Japan, have little or no relation to the industries of the feudal period. They were borrowed from the Occident fully born and developed, and they quickly and thoroughly displaced the primitive methods of spinning and iron making.

The other industries of Japan have their roots more firmly embedded in the country. To them, the contact with the West has brought little change. They still continue with much the same methods and types of organization that prevailed previous to the opening of the country. The domestic workshops are numerous, and among the factories the small establishment is a vital unit, if not the all-important unit, of production. Of the factory workers in industries other than cotton spinning, shipbuilding, and primary metallurgy, 49 per cent were in establishments employing fewer than 100 workers in 1924 and 29 per cent were in establishments with fewer than 30 workers. In addition to the 3,500 silk filatures of factory rank, employing 395,000 workers, there were, in 1928, 62,000 households reeling raw silk each averaging slightly more than one worker. In Suwa County, the heart of the raw silk district, there are about 3,000 farmers reeling silk in their homes.

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[1] *Trans-Pacific, op. cit.*, May 29, 1930.

[2] Ohara Social Research Institute, Labour Annual, Osaka, 1926 (Quoted in *Trans-Pacific, op. cit.*, Sept. 12, 1929); Statistics of Department of Commerce and Industry, *op. cit.*, 1927.

[3] Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

For the vast number of the smaller units, complete data are not available, since the factory statistics include only the establishments employing five or more workers. The extent and importance of the small units can be indicated to some degree, however, through the membership records of some of the trade associations. They are very numerous and they constitute an important part of Japan's industrial organization, if establishments of so small a size can be considered industrial.

The most important industry of Kyoto Prefecture is the weaving of silk cloth and of silk cloth mixed with cotton. In the prefecture is made about one-sixth of the silk cloth output of the country. The factory reports state that there are in the entire prefecture only 11,000 workers engaged in the silk and cotton cloth weaving industry, but according to an official of the Kyoto Nishijin Orimono Dogyo Kumiai, or the Kyoto Nishijin Silk Weavers' Trade Association, an organization limited to the vicinity of Kyoto City, its 12,000 members employ 40,000 workers in weaving. The discrepancy with the factory report is explained by the fact that 60 per cent of the members of the Association are domestic manufacturers with one or two looms and employing three or four workers. Among the factories in the Association, there is one with 600 looms and 300 workers, but the usual establishment has only 10 looms. Most of the cloth woven in Kyoto comes from the domestic workshops.

Another important industry of the Kyoto area is the dyeing and printing of cloth. According to the statistics of factories, there were in all of the prefecture in 1924 only 8,360 workers employed in establishments dyeing and bleaching cloth, but the Kyoto Somemono Dogyo Kumiai, or Kyoto Dyers' Trade Association, has 3,600 members employing 21,000 workers. There is one establishment with 300 workers, but most of the plants are small domestic shops with from 5 to 30 workers and many have only 2 or 3 workers.

Although practically all of the large cotton weaving factories are members of the Japan Cotton Spinners' Association, that organization includes only 20 per cent of the cotton looms of the country. The remaining 80 per cent are scattered about in small establishments and in homes. Of the cotton weaving mills, 93 per cent had fewer than 10 looms in 1928, and 49 per cent of the operatives in silk and cotton weaving were employed in establishments with fewer than 5 workers.[1]

Nagoya is a center of growing importance in the weaving industry. About half of the output of cloth is for export and the other half is for consumption in Japan. There is one large factory of 2,000 looms for the weaving of export cloth, but the establishment of more usual size for export cloth has 20 or 30 looms. The largest factory weaving cloth for Japanese consumption has only 30 looms and most of them have only 10. A large quantity of yarn is also sent to domestic workshops with one to three looms.

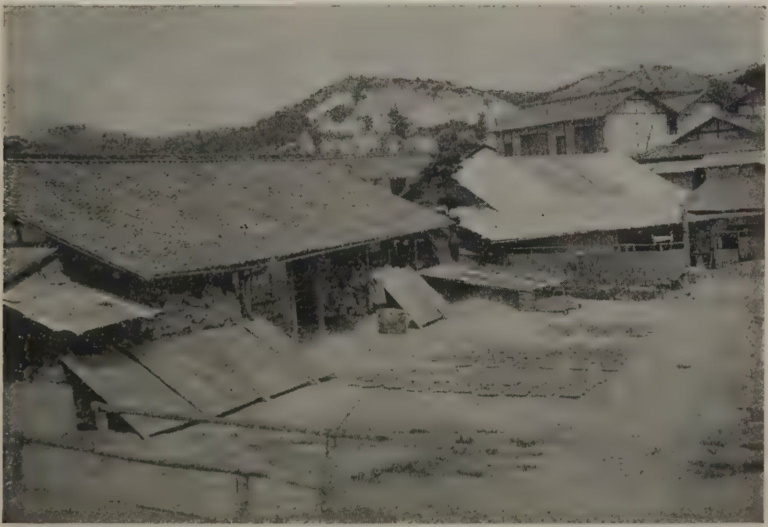

FIG. 60.—The potteries in Seto are small household establishments where most of the operations are done by hand. The ware is dried in the sun before it is fired. The kaolin deposit is in the background.

The pottery industry is largely a village, household industry. The following description of the industry written in 1878 is still accurate: "The villages in which faience and porcelain are made whose names are household words in America and Europe look like any other village. In the dingy, weather-beaten cottages made of wood, mud, reed, and thatch, the potters work before their paper windows." In a workshop there were rarely more than three or four workers and the kilns for the burning of the pottery were the property of the village.[1]

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[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

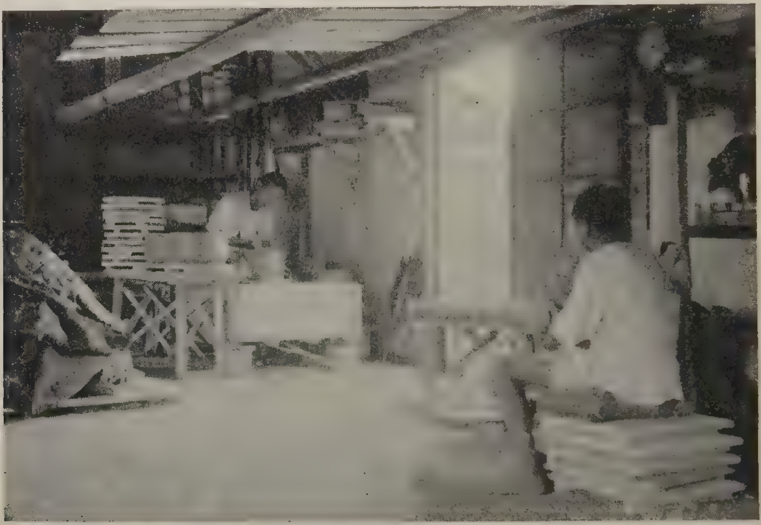

FIG. 61.—The interior of a typical pottery, Seto. It employs four to six workers. The wheel is turned by hand.

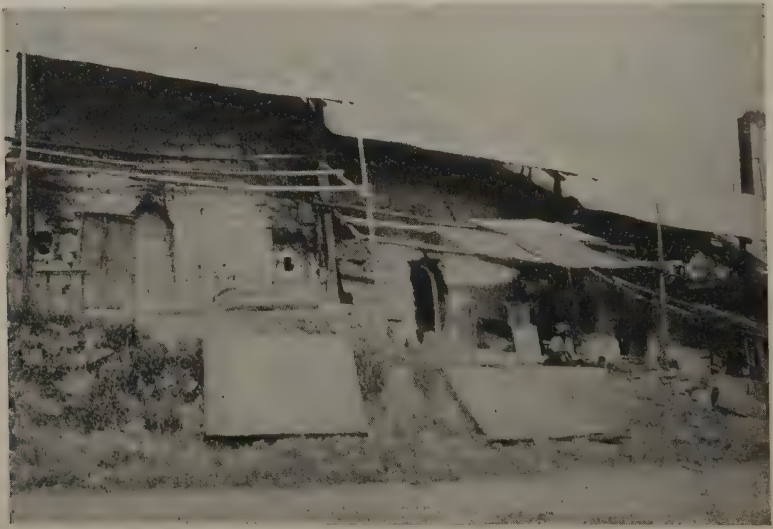

FIG. 62.—A group of pottery kilns at Seto, the common property of four household establishments.

The village of Seto, in Aichi Prefecture, is at present the leading center for the manufacture of pottery. Its product is the Japanese blue ware so common in America. There are in the area about the village almost 900 manufacturing establishments, but there is only one factory with more than 100 workers. Fully one-third of the manufacturers have only domestic workshops with 3 to 5 workers. Of the so-called factories, the unit of usual size has 10 to 15 workers. In the city of Nagoya, about 10 miles from Seto, there is one very large factory, that of the Japan Pottery Company. It employs 4,800 workers or more than one-half of the workers employed in the pottery factories of Aichi Prefecture as reported in the statistics of factories.

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[1] *Tokio Times*, July 20, 1878.

The pottery industry of Kyoto is organized on much the same scale as the industry in Aichi Perfecture. There are two large factories, one with 600 workers and the other with about 200, but the usual unit is the domestic workshop of 3 to 5 workers. The 320 members of the Kyoto Pottery Trade Association employed only 1,819 workers in 1926, or an average of under 3 workers per establishment.

FIG. 63.—The one pottery of factory size in the Seto district.

Sakai, a city near Osaka, produces most of the Japanese cutlery. It has been pointed out in an earlier chapter that it is a very ancient industry, dating from the early part of the feudal period. It is an industry that has been changed little with the introduction of western methods. There are about 500 manufacturers in the city, some carrying on the industry in their homes and others in buildings nearby. Most of the manufacturers employ only 4 or 5 workers and the largest has fewer than 30 workers.

In Kobe, there is one large rubber factory employing 1,300 workers and owned by British capital. The largest rubber factory under Japanese control employed in 1926 about 200 workers, but the unit of more usual size had 40 to 50 workers. There are a great number of smaller establishments that are little more than homes with scarcely any use of machinery.

Japanese clothing is made almost exclusively in domestic workshops. The largest shop in Osaka, and one of the largest in Japan, employs 80 workers. There are a few with 40 to 50 workers and a great many that are much smaller. Straw braid and hats are made in Okayama and Kagawa Prefectures, on the Inland Sea, from the barley straw grown there. Soon after the opening of the country, the industry became a factory industry, but the expenses were so high that in 1884 the factory was closed and the braid and hats have since been made as a by-occupation of the farmers. No machinery is used.

It is not necessary to cite further examples. In most of the Japanese industries, with the exception of the spinning of cotton yarn and the making of heavy iron and steel products, the unit of production is small, and most of the industrial sections are made up of small establishments. The Honjo section, situated along the Sumida River, is one of the principal factory sections of Tokyo City. It includes a few large factories, but most of the establishments are little more than domestic workshops making a great variety of products from paper lanterns to iron nails. There were in Honjo some 300 glass factories in 1926, each with two or three furnaces and employing not more than 40 workers. In Honjo and in the contiguous section of Fukagawa, there are reported to be 200 small workshops with 10 to 30 workers.[1] They are operated under the domestic industrial system, for most of the workers are apprentices living with the master and learning the trade under his supervision. During the period of apprenticeship, they receive free lodging and board, but little or no pay. This same apprenticeship system prevails throughout Japan in practically every craft industry that has not been taken over by the factory.

The City of Osaka is the great factory center of Japan and in its appearance it does suggest the factory city of England or of the United States to a much greater degree than any other Japanese city. There are numerous large establishments, mostly engaged in cotton spinning, in making heavy metal products, or in sugar refining; but small scale industry is the dominant factor. There were in the city in 1924 about 19,000 industrial establishments and of that number 13,000 employed fewer than five workers.[2]

[1] *Trans-Pacific*, *op. cit.*, Sept. 10, 1927.

[2] Statistical Abstract for Osaka, *op. cit.*, 1924.

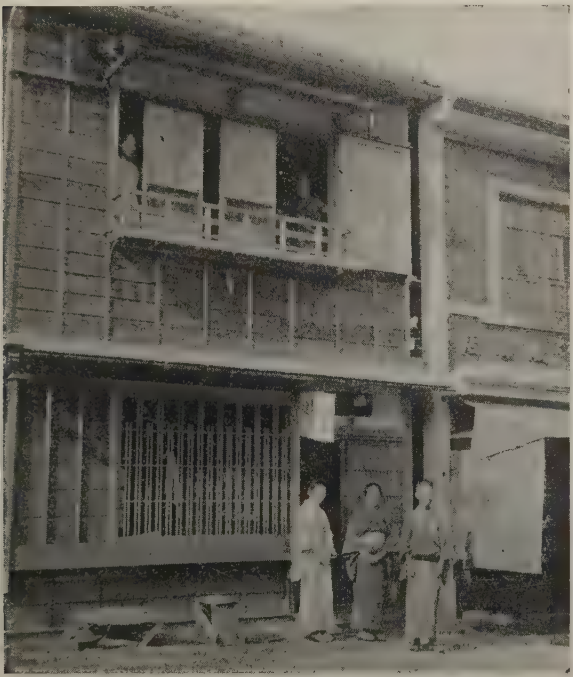

FIG. 64.—The home and workshop of a manufacturer of Japanese clothing.

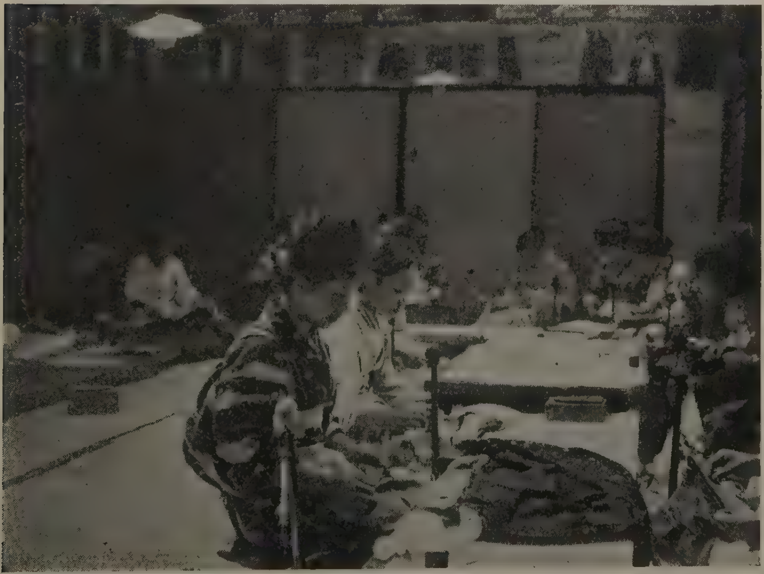

FIG. 65.—Workroom of one of the largest establishments making Japanese clothing. All of the work is done by hand.

THE PREVALENCE OF THE CONTRACT SYSTEM

Not only has the manufacturing unit remained small in Japan, but in many of the industries the organization and the methods are essentially those prevailing in England prior to the Industrial Revolution. The raw materials are purchased and the finished product disposed of by an entrepreneur who in some industries is the wholesale or retail merchant, and in others the jobber. The actual manufacturing is done under a contract system in domestic workshops, and if the article is at all complicated it may go into a number of homes. The entrepreneur may or may not carry on any step of the manufacture in his own establishment. If he does, it is usually the final assembling or finishing processes.

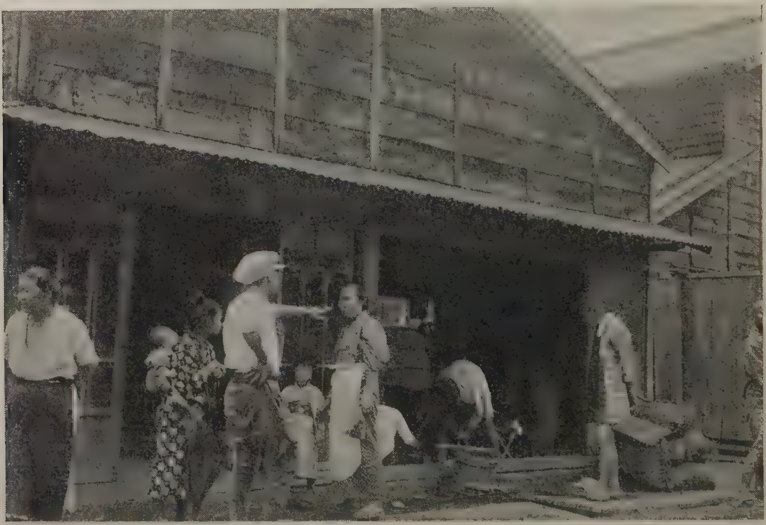

FIG. 66.—A household blacksmith shop in Tokyo making nails by hand. Compare Figure 29.

The Making of Lanterns and Umbrellas

In the city of Gifu, two important industries are the making of paper lanterns and umbrellas. In both, the entrepreneur is the wholesale merchant though locally he is called the manufacturer. The lantern is sent to six different families each completing one process, either in the making of the frame or in the cutting and pasting of the paper. The decoration is usually added by the wholesaler in his own shop. The industry is a small one and not more than 150 families in the community are engaged in it. The division of labor is a recent development, for at the beginning of the Meiji period it was usual for one family to complete the lanterns. The paper, an especially tough variety, is also made in Gifu, but its manufacture is an industry quite distinct from the manufacture of the lanterns.

The making of the paper umbrellas is a more important industry than the making of the lanterns, for there is a large demand for them in Japan and some are exported. According to the statement of an official of the Gifu Prefecture Umbrella Trade Association, there are in and near the city over 3,000 families engaged in the manufacture of the umbrellas. Though both the umbrellas and the lanterns are made of paper and bamboo and many of the processes are similar, the same family would never work on both articles. The wholesaler sends the necessary materials to one family for the fashioning of the central bamboo shaft. A second family makes the round piece that slides up and down on the shaft and to which the ribs are later attached. A third family brings together the round piece and the shaft and inserts the spring or catch. A fourth family fashions the ribs and a fifth attaches them to the frame and ties in the string braces. A sixth family dyes the paper and a seventh pastes it upon the ribs. An eighth family lacquers and polishes the handle and oils the paper. This step in the manufacture may be done by the wholesaler. If the umbrella is to have any design on it, he also adds it. The umbrella is then ready to be retailed

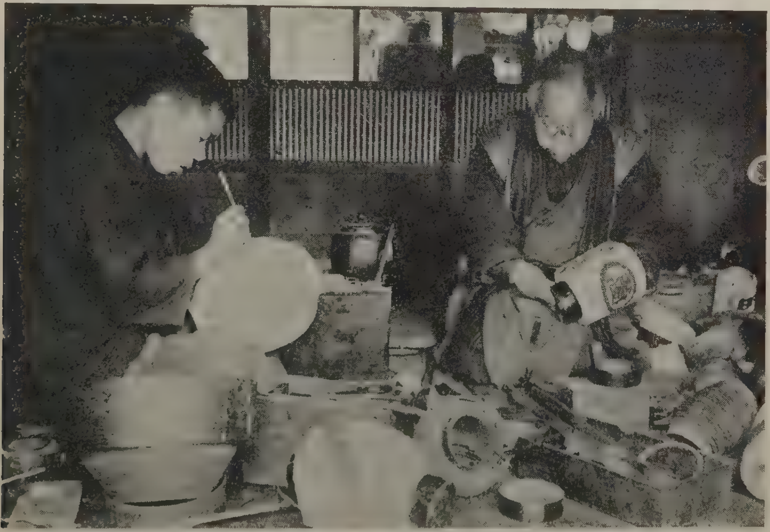

FIG. 67.—The final operation in the making of Japanese lanterns. (*Photograph by H. Suito, Tokyo.*)

locally in Gifu, to be sold to wholesalers in other parts of Japan, or to be exported. According to the Umbrella Trade Association, 40 families of Gifu and vicinity are engaged in the first process, 80 in the second, 150 in the third, 800 in the fourth, 50 in the sixth, 1,300 in the seventh, and 300 in the eighth. The number in the fifth is not known. The families are paid by the 100 pieces completed.

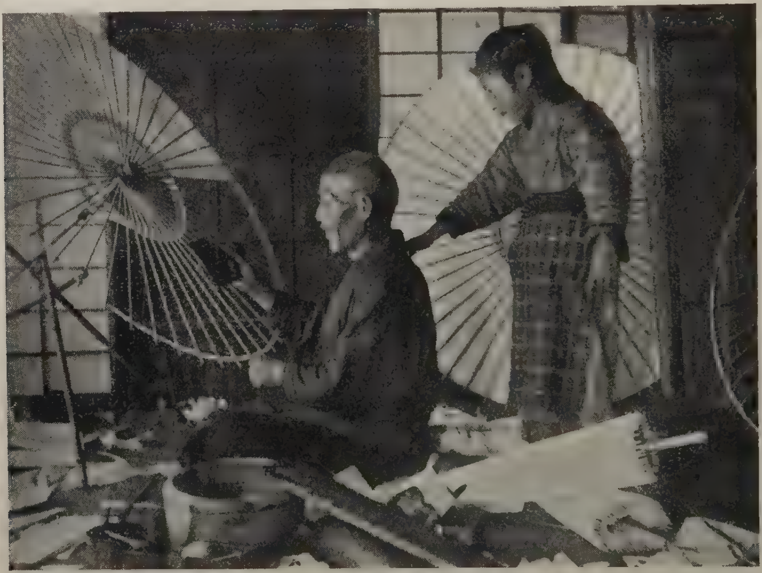

FIG. 68.—The Japanese umbrella is the product of a number of shops. In this one the paper is being attached to the ribs. (*Photograph by H. Suito, Tokyo.*)

The Geta Industry

Another industry organized in much the same manner is the making of the geta, or the wooden clog that the Japanese use for street wear. It is a simple foot protection consisting only of a flat wooden piece about the size of the foot with two wooden cleats or stilts on the bottom to raise it out of the mud or dust. The geta is held on by a strap fastened about midway on each side and running diagonally across the instep to a smaller strap attached near the front of the wooden piece and passing between the big toe and the second toe. The wooden part is cut out in rough form in the country districts from the light and strong timber of the paulownia tree. It is shaped in a factory and then sent to the retail merchant, either directly or through a wholesaler. The manufacture of the strap or hanao is more complicated. Here again the entrepreneur is a wholesale merchant. The actual manufacture is done by four groups of families. The materials of the strap are cloth, cord, and raw cotton. The wholesaler cuts the cloth, or perhaps he purchases it already cut from the factory, and sends it to one group of families to be sewed into tubes about a foot long and one-half an inch in diameter. A second group of families inserts into this tube the cord wrapped in raw cotton to prevent it cutting the instep. A third group makes the short strap that passes between the toes, and a fourth group fastens the long strap and the short strap together. The wholesaler bends the finished straps into the proper shape and ties them up in pairs. They are sold to the retailer who adds them to the wooden pieces and thus completes the geta. The manufacture of the geta is carried on in every large city, but in Tokyo it is especially important. The manufacture of the straps is concentrated in one section near the Asakusa amusement park. Along one street—very straight and long for a Tokyo street—running parallel to the Sumida River, almost every shop is a wholesaler of geta straps. The manufacture is done by the families of the adjacent areas. It is said that the industry has located in this particular section of the city because of the labor available in the homes of the workers employed in the factories along the river.

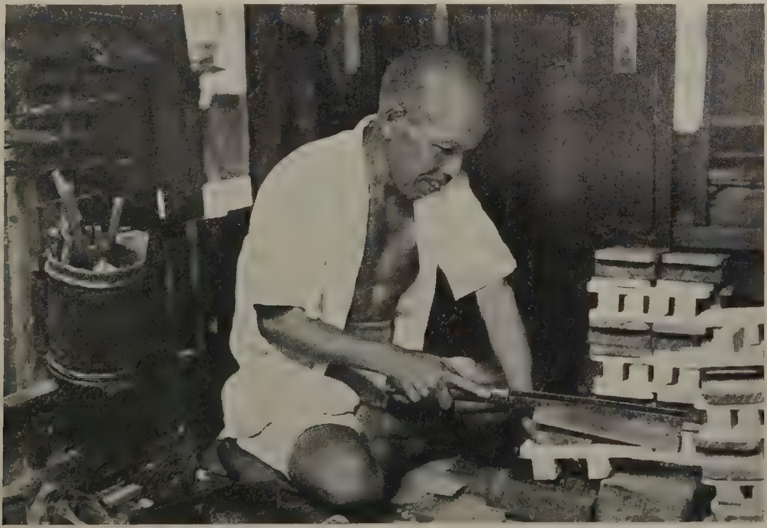

FIG. 69.—A maker of the wooden clogs or geta for street wear. (*Photograph by H. Suito, Tokyo.*)

Pottery, Brushes, Cutlery and Silk Cloth

In the pottery industry of Seto and Nagoya, the white ware is sent out to many homes and small workshops to be decorated, each establishment specializing in one type of design, and then is returned to the factory for the final firing.

Japan has gained world-wide recognition in the manufacture of toilet brushes, most of which are made in and near Osaka. Until about 20 years ago, brush making was entirely a domestic industry. At present, the handles for the finer articles are shaped and polished and the finished brush is sterilized in a small factory, but the bristles are drawn in the homes of the Osaka factory workers or in the farmhouses of the rural areas about the city. It is customary for the manufacturer to send the brushes and bristles for drawing to the farmers or homes of the workers through a contractor who has the necessary contacts and undertakes the transport of the materials and finished pieces. During June and November, two especially busy months on the farm, no brushes are sent to the farmhouses. There are also in the brush industry jobbers who do none of the manufacturing themselves but send the raw materials to a series of small domestic workshops, each one completing a part of the manufacturing process. One part of the industry, especially that manufacturing the cheaper brushes, is in a somewhat different stage of development more or less intermediate between the domestic and the factory system. There are in Osaka several large buildings in which is installed electrically driven machinery for shaping the brushes. The machines and power are rented to individual workmen who are working under contract for a jobber and who complete one process in the manufacture of the brushes at so much per piece. Some of the workers rent more than one machine and employ helpers. It would seem probable that ultimately these establishments and the machinery will be acquired by the jobber or by a more successful workman, and the independent artisans will become workers on a time or piece wage, and the factory system in the brush industry will have been fully established.

In one of the villages near Osaka, there is a factory in the midst of the rice fields making toothbrushes for an American ten-cent store. In two branches, 150 workers are employed. Some of the bristles are drawn in the homes of the farmers, but the factory has also provided four buildings, equipped with bristle-drawing machines, to which the farm people, mostly women, come when their household duties permit. Usually about 200 are at work. They are paid by the piece.

The cutlery industry of Sakai has already been mentioned in the discussion of the small size of the industrial establishments. It is largely a domestic or semi-domestic industry with an entrepreneur, here called a manufacturer. He is sometimes a wholesaler, supplying the retailer with the finished product, or he may be a retailer, or he may combine both functions. The manufacturer purchases the raw material and sends it, if it is to be a fish knife, for example, to one workshop for shaping and to a second for edging. The handles are made by a third family. It is usual for the manufacturer himself to put on the handle and to give the edge its final grinding. Other pieces of cutlery may be completed in one or two workshops. There were in Sakai in 1926 about 500 of the so-called manufacturers and 3,000 workers engaged in the making of cutlery. One of the larger manufacturers was sending out work to more than 20 households. During the World War, he had had a small factory employing 100 workers in the manufacture of cutlery for export to Asia, but it is no longer in operation.

The weaving industry of Kyoto is an industry with an annual product valued at over $50,000,000, yet most of the cloth is made in homes or in domestic workshops. There are in the industry several forms of organization. Some of the manufacturers have their own factories and make on their own premises all of the cloth that they handle. Others have no looms and depend entirely upon the domestic workers for their production. Still others have a few looms, but send out a part of their work to homes and to small workshops. One manufacturer of this type had eight looms and employed in addition 70 households each with one to three looms.

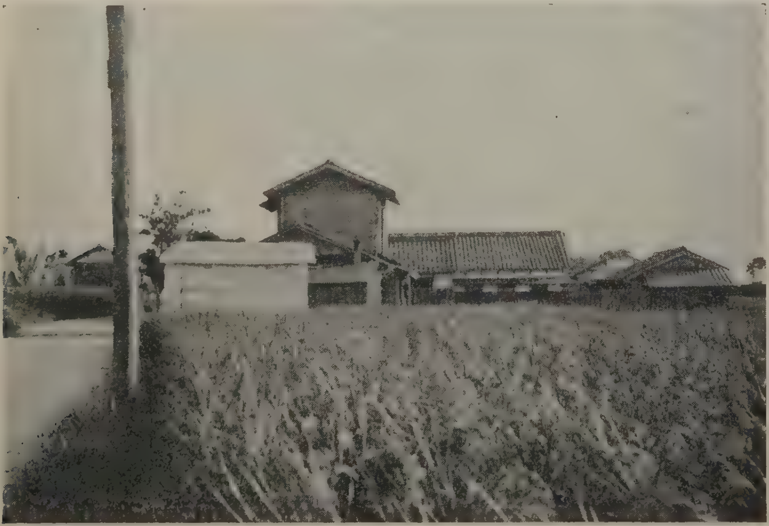

FIG. 70.—A small brush factory in the midst of rice fields. Tooth brushes were being made with hand machines for an American ten-cent store.

The Organization of the Cloth Industry

The manufacture of cotton crêpe is an excellent illustration with which to conclude the discussion of the contract system, for it is an industry with many distinct operations and its product is intended not only for domestic consumption but it is also the one variety of cotton cloth exported in any large quantity from Japan to the United States. The leading district for its manufacture is in and near Sano, a village about 50 miles north of Tokyo. Nearby is the village of Ashikaga whose specialty is a cloth of cotton and silk mixed and whose weaving industry has the same organization as the industry of Sano. The value of the cloth output of these two villages and their tributary areas for 1925 was approximately $24,000,000.[1]

There are in the district a few small factories recently established, but most of the cloth—over four-fifths in the Sano area and nine-tenths in the Ashikaga area—is still made in the homes of the farmers. So dependent is the industry upon the farm households that it passes through a dull season in February and March, May, June and July, and October and November, the months of the year when the work of the farm occupies the farmer and his family and allows them no time for weaving. It was possible to visit in the two villages every step of the manufacturing process through to the finished cloth ready for shipment to other parts of Japan or to foreign countries.

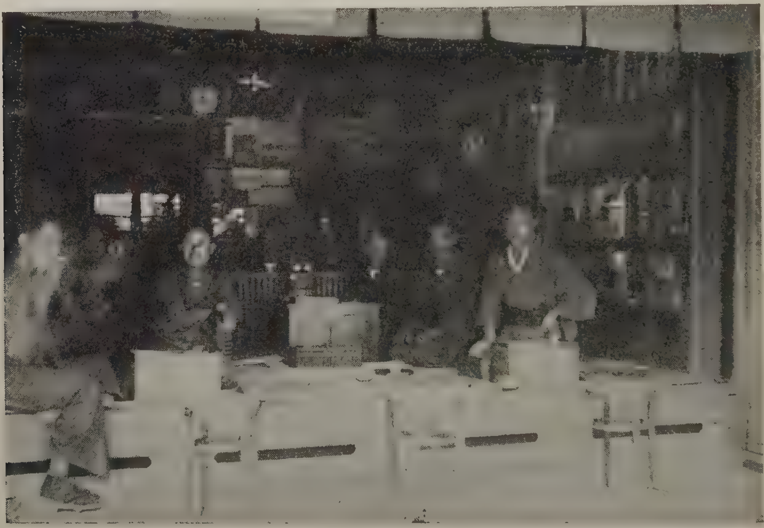

FIG. 71.—A cotton yarn shop selling to jobbers and small manufacturers of cloth. Tea is served to the customers in the old Japanese fashion.

The first establishment visited was the shop of a yarn merchant who purchased the cotton yarn from a wholesaler in Tokyo. The business had been started by the grandfather of the present owner and during the three generations it had gone through few changes excepting that the yarn had been purchased in Manchester or in the United States during the first generation. This particular merchant was of the opinion that 20 per cent of his yarn went to the factories and 80 per cent to the entrepreneurs or jobbers, of whom there were 280 in the Sano area in 1925 and probably 700 or 800 in the Ashikaga area.

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[1] The author is indebted to H. C. Chalmers, formerly with the U. S. Tariff Commission and now with the Bureau of Foreign and Domestic Commerce, for directing his attention to the cotton industry of the Sano-Ashikaga district.

Several of the jobbers were visited. Their place of business is usually a small office in the front part of the family dwelling. One had established his business in 1886. The business of a second had been established by his father in 1875, and of a third by a grandfather 90 years ago. Still another was in the second generation. With exceptions that will be noted, the jobbers all serve much the same function in the manufacture of the cloth. They purchase the raw material and market the finished product. If the cloth is to be of the dyed-in-the-yarn type, the cotton yarn is first sent to the dyers, or if it is to be white, the yarn goes to the bleacher and cleaner. There are many of the dyers and bleachers, about 400 in the Ashikaga area and 100 in the Sano. A very few have as many as 25 workers, but most of them have not more than 5 or 6. The equipment is simple—a shed, a few vats, and an open fireplace. They are usually situated in the midst of the rice fields along the Watarase River or one of its tributaries and the yarn after dyeing or bleaching is washed in the river. For drying, it is hung in skeins in the yard surrounding the shed.

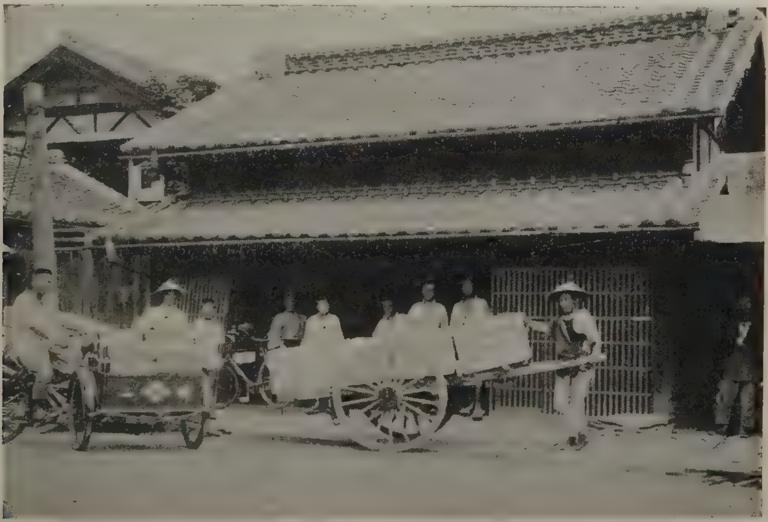

FIG. 72.—The establishment of a cloth jobber who sends out the yarn to farmers for weaving.

From the dyer, the yarn is returned to the jobber, and if crêpe is to be made, the weft threads are sent to a twister. The twisting is done in small domestic establishments that dot the rice fields about Sano and Ashikaga. They are especially numerous along the main road between

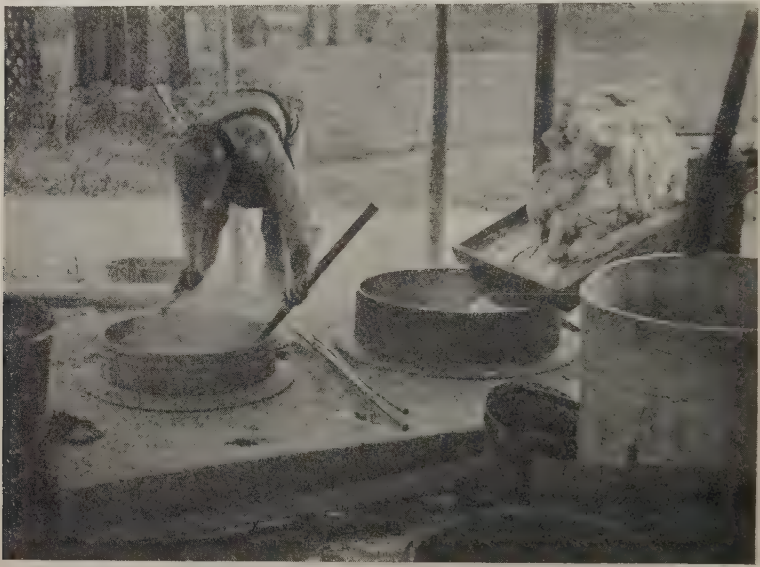

FIG. 73.—A dyer of yarns. (*Photograph by H. Suito, Tokyo.*)

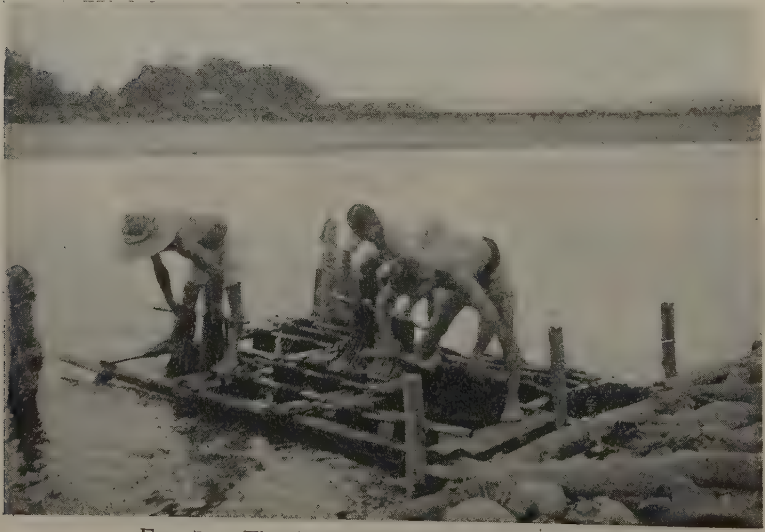

FIG. 74.—The dyed yarn is washed in the river.

Ashikaga and Kiryu and are to be recognized by the undershot water wheels on the side of the house. The power is derived from the canal that is bringing the water for the irrigation of the rice. It is usual for these establishments to be divided into two almost equal parts. In

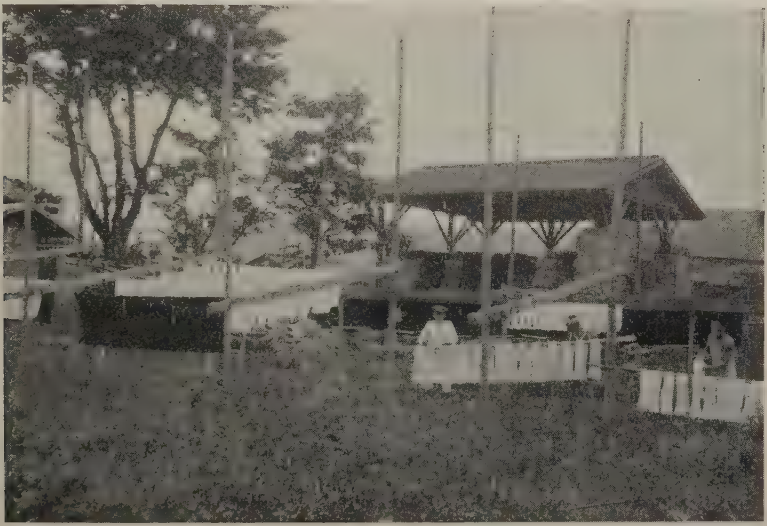

FIG. 75.—Dyed and bleached yarn drying in the yard of a small establishment near Ashikaga.

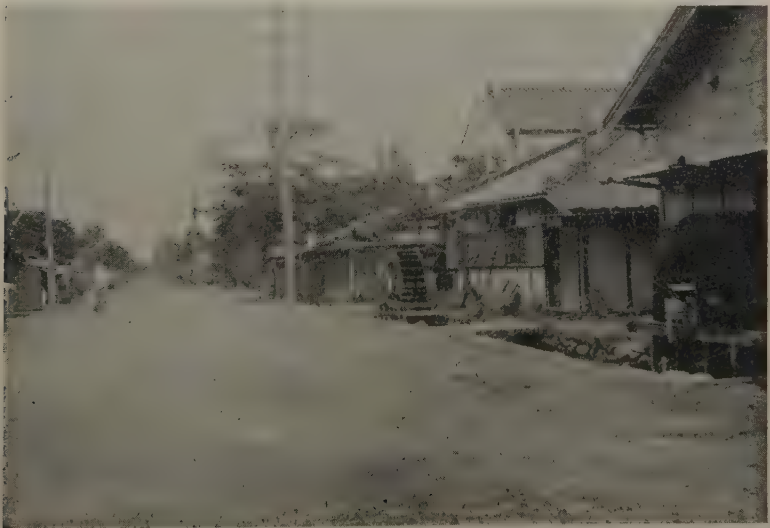

FIG. 76.—A village near Ashikaga. Almost every home is a small yarn-twisting factory. Power is derived from the undershot water wheels in the irrigation canals.

one half, the family lives; the other is filled with the twisting machinery, a complicated mass of strings and wooden wheels and spindles. It requires little power and is usually made by a craftsman in the vicinity who can be called upon to keep it in repair. The twisters employ from three to five workers, either members of the family or neighbors.

The twisted weft yarn is returned to the jobber. He, in the meantime, in his own establishment, has arranged the warp thread upon the beam ready to insert into the loom. The beam and the weft thread in skeins are sent to the farmer-weaver. Almost every farm household does some weaving. It is estimated that around Sano there are 15,000 or 16,000 farmer-weavers, most of them within 6 miles of the village and the most distant not more than 20 miles away. Around Ashikaga there are probably 10,000. These two estimates do not by any means complete the total, for in the same section of Japan there are other villages acting as the nuclei for a rural weaving industry. Apparently in olden times, the farmers were independent weavers, purchasing their own raw materials and selling their cloth in the local market; but this type of industry disappeared long ago and certainly has been of no significance since the opening of Japan. The financing of the cloth production has been taken over entirely by the jobbers.

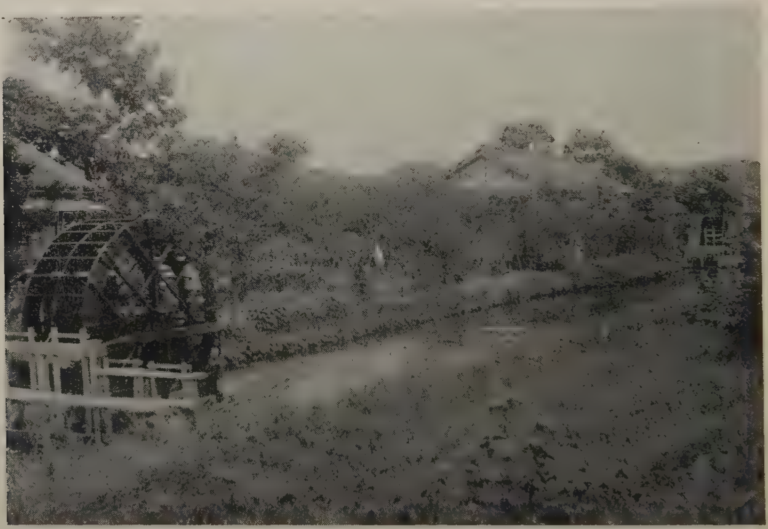

FIG. 77.—A water wheel on the irrigation canal provides enough power to turn the yarn-twisting machinery that occupies half of many farm houses in the Ashikaga district.

The more wealthy farmers may have as many as five, or even more looms. It is more usual for them to have two or three. The weaving is not the main occupation, but a side activity of farming and is carried on by the women and by the very old and the very young. In the several households visited, the men were absent in the fields and the looms were being operated by women who were being assisted in the winding of the thread from the skeins to the bobbins and in other ways by the grandfathers and grandmothers of the family and occasionally by the children.

As in the case of the twisting machinery, the loom is made by the local craftsman. It is a rather bulky object, dominating the farmers' cottages and leaving little space for the living quarters. Practically all of the looms are equipped with fly shuttles and most of them are operated by foot power though a few make use of water power and an increasing number are being driven by small motors and electrical power.

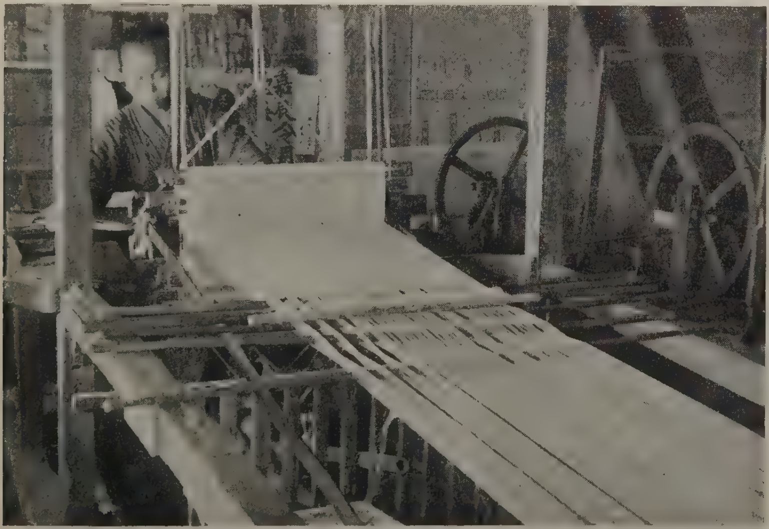

FIG. 78.—A great deal of Japanese cloth is woven in farm houses on hand looms. (*Photograph by H. Suito, Tokyo.*) Compare Figure 34.

A large jobber will send materials to 100 or 200 farmers and a small jobber to only 10 to 20. One of the jobbers visited in Sano was especially important and sent yarn to 200 farmers with 450 looms. Another sent to 80 farmers with 100 looms and a third to 70 farmers with 110 looms. The number, of course, can be easily expanded and contracted with the demands of the market. Payment is made to the farmer by the jobber on a piece-rate basis. Working in the time not demanded by her household duties, a woman is able to earn about 30 cents a day. If she works steadily, she may make 50 cents or even one dollar a day. There is the temptation, since there is no supervision, to work very long hours.

From the farmer, the cloth is returned to the jobber. Some of the jobbers have recently added to their establishments small factories equipped with power looms. One jobber in Sano had 12 looms and another 50 looms, but both sent yarn to farm households for weaving. In general, the cloth made on the farmers' looms is of the narrow width for consumption in Japan; the cloth from the power looms of the jobber is of the wider widths for export. One jobber has purchased 44 power looms that are rented out, 2 or 3 looms to each household. The yarn is sent to these households just as it is to the farmer-weavers with the foot power looms and compensation is by the piece.

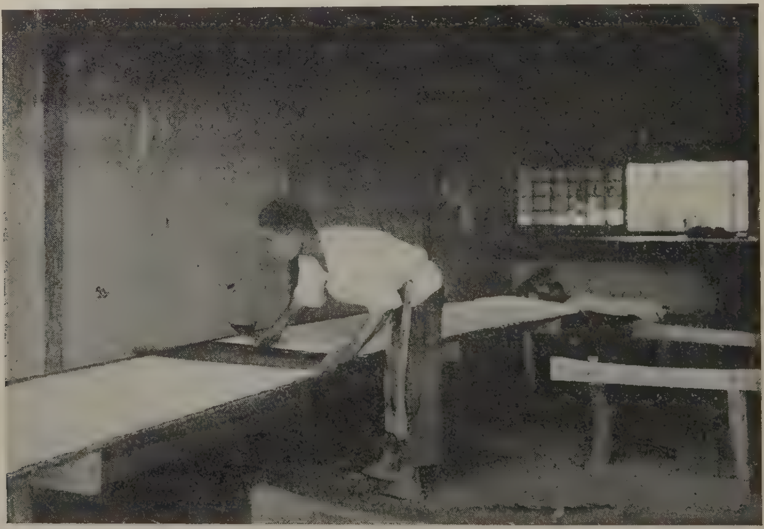

FIG. 79.—Cloth is still printed by hand with a stencil. Compare Figure 31.

One small factory visited included in its history most of the steps in the development of the modern industrial system. The business was established in 1875 and for the first six years it was purely a jobbing business sending out cotton yarn, and sometimes cotton and silk yarn, to farmers for the weaving of the narrow width for domestic consumption. A small factory with 15 foot-power looms was established in 1881, but most of the cloth still came from the homes of farmers. In 1885, the cotton and the mixed cloth were displaced by silk cloth for export. There was a return to cotton and silk mixed for home consumption in 1895 and, since 1905, only cotton crêpe for export has been made. The number of foot power looms was increased gradually and, in 1910, 12 electric power looms were introduced. By 1914, 8 more electric looms had been added and all the foot power looms discarded.

The business was stimulated greatly by the World War and now has 50 power looms. As the production of the factory has increased, less and less dependence has been placed upon the farmer-weavers, and at present no yarn is sent to them by this factory. Most of the small factories in the district have had much the same history though a few have been established without any such background.

Formerly, the jobber disposed of his cloth in the local market, held in Sano on Monday, in Kiryu on Tuesday, in Ashikaga on Thursday, and in the other villages of the district on other days of the week. It is claimed that the development and the prosperity of the Ashikaga-Sano cloth manufacturing district are to be traced largely to the establishment of this market-day system early in the nineteenth century. At the market, the farmer-weaver and later the jobber met the wholesaler who purchased the cloth for distribution in other parts of Japan. As the units of production and also of consumption became larger, there was less necessity for the market and it is no longer of any importance. The jobber at his place of business sells his cloth, whether it comes from the farm looms or from his factory, directly to the wholesaler. For the very small jobbers, there is an intermediate commission broker who collects the cloth in lots of sufficient size to meet the needs of the wholesaler. The wholesaler is supposed to be in close touch with the tastes of the market and he sends the cloth to be dyed or printed, and finished, sometimes to his own establishment

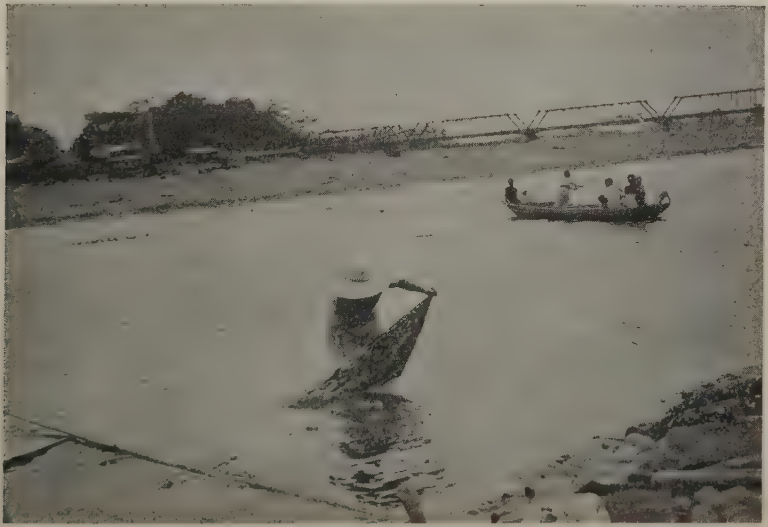

FIG. 80.—A nearby river is generally used for washing the cloth printed or dyed in the small workshops.

and sometimes to an independent establishment. One large wholesaler of Ashikaga, who specialized in cloth for export, had five dyeing plants, three printing plants, and three plants for cleaning cloth, each employing about 30 workers. The dyeing and printing establishments differ but little from the dyers and bleachers of yarn already described. The largest printing plant in the Sano district employs 25 workers and has a printing machine that does six colors at once, one of the few machines of that type in Japan. In a plant of about the same size in Ashikaga, the cloth was stretched on a long board, and the printing was done by hand by means of a stencil, one color at a time. The cloth after printing or dyeing was washed in the river and in both establishments it was hung in the yard on large racks to dry. The wholesalers dispose of the finished cloth to a wholesaler in another part of Japan or to an export agent at one of the ports.

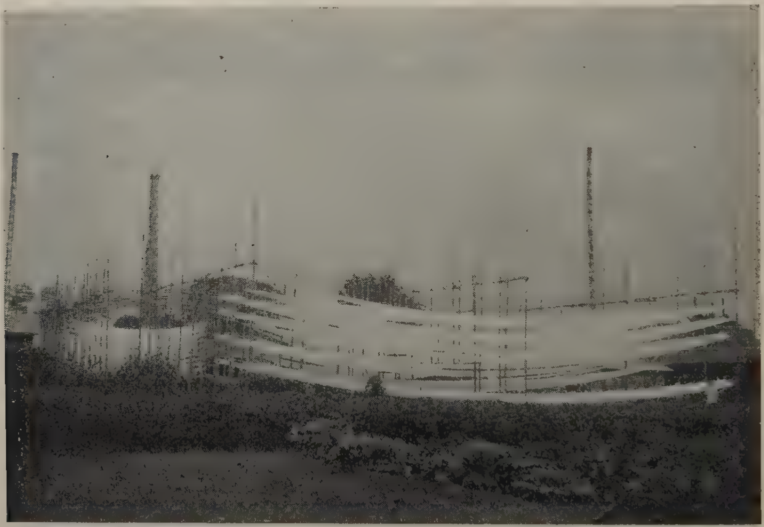

FIG. 81.—Cloth hung to dry in the yard of one of the few modern dyeing and bleaching factories in the Ashikaga district.

Various explanations were offered by the jobbers and factory owners for the persistence of the contract system, an almost medieval type of organization. All seem to be agreed that the jobber system is due in part to the scarcity of capital. As the business is now organized, no large investment is necessary, and each farm household provides its own machinery. The entrepreneur or jobber advances only the money required for the purchase of the raw materials, and his capital is tied up only until the cloth can be made and sold to the wholesaler. Some of the small factories that have been started are so short of capital that the wholesaler, when he places an order for cloth, may have to purchase the yarn that is required. The factory thus has much the same relation to the wholesaler as the farmer-weaver does to the jobber.

It was also stated that so many different kinds of cloth were demanded that a factory, with its larger output, found it much more expensive than the small unit to make the alterations in the looms necessitated by the constant changes in design and variety. Some of the special weaves, so it is claimed, cannot be made in factories.

A few of those questioned were of the opinion that the organization was to be explained entirely by habit or inertia, that it had been the prevailing organization for so long a period that the people were loath to change. It might be suggested that this reluctance is due not only to conservatism but also to the absence of any familiarity with or training in the administration and direction of business on a larger scale. It is a simple matter to send out yarn to widely scattered farmers who are paid only for what they produce and who supply their own equipment. It is more difficult to assemble the machinery and the labor in one factory and to supervise it in such a fashion as to insure profitable operation. The factory laws do not apply to the farm households, and there are no restrictions on the length of the working day. The farmers regard the weaving as a by-occupation and are undoubtedly content to accept a lower return for their labor than they would demand if they were dependent entirely upon weaving.

Modern times are bringing about new conditions in the industry. Larger lots of cloth of one variety and of standard quality are being demanded. The growth of the export business depends upon an improvement in quality that is possible only with better equipment and closer supervision of manufacture. Many of the larger wholesalers prefer to place their orders with the factories and the tendency is for the factory to replace the jobber, but as one manufacturer expressed it, "the jobber is still the life of the district."

Whatever its explanation, the contract system prevails in a surprisingly large number of Japanese industries which produce wares both for home consumption and for export. The Sano-Ashikaga cloth district is not an isolated example. The same organization is duplicated in many other parts of Japan, even in the vicinity of the large cities such as Osaka, Tokyo, and Nagoya. It has been pointed out that the contract system prevails in the lantern and umbrella industry, in the making of brushes, pottery, cutlery, and shoes, and in the weaving of silk cloth. The wholesalers of Osaka send cotton and artificial silk yarn to households in nearby villages for twisting and to small village factories for weaving. In Nagoya, the cloth for export is made in factories, but an important part of that intended for consumption within the country is made for manufacturers by some 2,000 households with from one to three hand looms. In Ichinomiya, a center for the weaving of woolen cloth, most of the manufacturing is done in domestic establishments and small weaving sheds. Some of the manufacturers are even of the opinion that they can produce cloth at a lower cost in the homes than in the factory and that at present the contract system is gaining at the expense of the factory.

The contract system is found also in the making of straw braid, lacquer ware, toys, matches, beads, hand embroidery, and in many other industries. This type of organization cannot be called a factory system. It is the old domestic system with any necessary division of labor accomplished through a division of establishment. In the many Japanese industries where this method is still followed, the Industrial Revolution has not occurred. There has been no divorcing of the labor from the land and no concentration into factories.

CHAPTER XII

THE PROGRESS OF FACTORY DEVELOPMENT

IT is in the textile industries, especially in cotton spinning and silk reeling, that Japan has made the most significant progress in industrialization and in factory development. The textile group far overshadows the other industries in importance. It employs more workers than all the other industrial groups combined (see Figure 82) and its product is the basis of the Japanese export trade. The weaving industry still continues as a household and workshop industry, but a relatively small amount of silk is now reeled in the homes and cotton spinning is exclusively a factory industry.

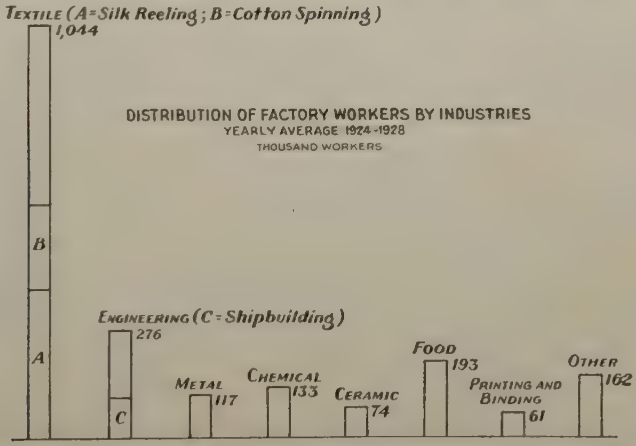

FIG. 82.—The textile industries of Japan employ more factory workers than all other industries combined.[1]

THE IMPORTANCE OF SILK REELING IN INDUSTRIAL PROGRESS

The most important single textile industry is the reeling of raw silk. It employs about 20 per cent of all the factory workers and, as the chart shows, it is more important not only than any other single industry but than any group of industries outside the textiles. In an earlier chapter, it has been pointed out that raw silk constitutes approximately one-eighth of the value of all Japanese manufactured goods and from 35 to 40 per cent of the value of Japanese exports. No other manufacturing industry and no other product holds so important a position in Japanese economic development.

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[1] Data from Japan, Statistics of Department of Commerce and Industry, *op. cit.*

Not only is silk reeling the vital industry of the country, but Japan has become the world's principal source of raw silk. China is perhaps a larger producer, though no exact data are available, but with that exception, Japan leads all the other countries in output (see Table IX). In export, Japan far surpasses China. In recent years, from 60 to 65 per cent of the raw silk entering world trade has originated in Japan.

TABLE IX.—WORLD'S SUPPLY OF RAW SILK[1]
(4 years' average, metric tons)

	Production[2]
Japan (1925 to 1928)	35,560
Korea (1924 to 1927)	956
Italy (1925 to 1928)	5,010
France (1923 to 1926)	334
Southeast Europe (1924 to 1927)[3]	292
Syria and Cyprus (1924 to 1927)	264
Greece (1924 to 1927)	259
Spain (1924 to 1927)	91
Turkey (1924 to 1927)	84
	Export
Japan (1925 to 1928)	29,436
China (1925 to 1928)	10,210
India (1925 to 1928)	64
Indio-China (1925 to 1928)	50
Turkestan, Caucasia, and Persia (1924 to 1927)	189
Italy (1924 to 1927)	5,712
France (1925 to 1927)	472

[1] Data for the above averages from the following sources: Japan, Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928, and Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.;* India, Department of Commercial Intelligence and Statistics, Statistical Abstract for British India, 1917–1927, and Annual Statement of the Sea-Borne Trade of British India, 1927; Italy, Annuario Statistico Italiano, *op. cit.*, 1929; France, Annuarie Statistique de la France, 1927; Indo-China, Rapport sur la Navigation et le Mouvement Commercial de l'Indochine, 1928; China, Maritime Customs, Foreign Trade of China, 1928; International Statistical Year Book, *op. cit.*, 1928; U. S. Commerce Yearbook, *op. cit.*, 1929.

[2] Production statistics not available for China, India, Indo-China, Turkestan, Caucasia, and Persia.

[3] Southeast Europe includes Austria, Hungary, the Kingdom of the Serbs, Croats and Slovenes, Roumania and Bulgaria.

The commanding position that Japan now occupies in the world silk industry depends in part upon a climate favorable to the mulberry and to the cocoon and in part upon cheap labor, but China has just as favorable a climate and cheaper labor. Japan has secured her virtual monopoly of the silk trade through the development of steam filatures and through the persistent, though not completely successful, efforts of the government and the producers to improve quality and to standardize the product.

Though the reeling of silk has become very largely a factory industry, the manufacturing process is a comparatively simple mechanical process requiring little power and no complicated machinery. The product, raw silk, is essentially a raw material but one step removed from its agricultural origin. In Japanese official statistical reports, silk reeling is included with the agricultural industries.

The industry rests upon a rather unsound economic foundation, for by far the largest item in the cost of producing raw silk is the cost of the cocoons, which is kept down through the utilization of labor for which no proper charge is made. According to the estimates of the Department of Agriculture and Forestry, the farm value of the cocoons in recent years has been about 70 per cent of the value of the raw silk output of the country.[1] The officials of the Nagano Prefecture Federation of Raw Silk Trade Associations stated in 1926 that 81 per cent of the cost of producing raw silk was due to the cost of the cocoons. Under the present system of production, the cost of the cocoons would undoubtedly be much higher if the labor required in their rearing was paid at all adequately. The cocoons are produced almost exclusively in the homes of the small farmers, the number of producers in 1928 totaling over 2,000,000. The industry is nearly always a subsidiary activity carried on along with the cultivation of rice.

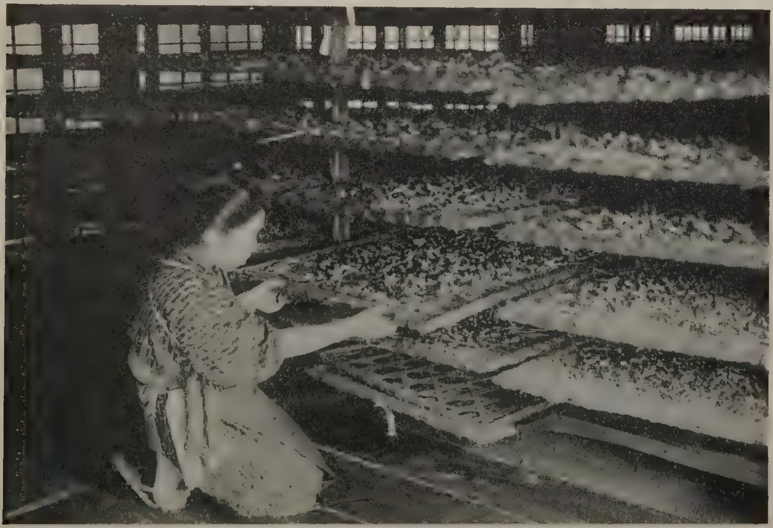

FIG. 83.—Trays of hungry silkworms, which must be tended constantly until they spin their cocoons, fill the farm houses in the silk areas during the rearing seasons. (*Photograph by H. Suito, Tokyo.*)

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[1] Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928.

During the cocoon seasons, however, it is apt to dominate the household, for so much room is required for the feeding trays that little space is left for the family. The women and children gather the mulberry leaves and give the worms the exacting care that they demand. It is rare that any outside labor is hired and so no wage is determined. To the family labor, no wage is paid and little consideration is given to its cost in estimating the costs of production. If the farmer gets a fair return for the use of his mulberry land plus a little additional, he feels that he has received sufficient compensation to justify the rearing of the cocoons. One farmer interviewed in Kofu had ¼ acre of land in mulberry. He sometimes sold the leaves to other farmers and sometimes he used them to rear silkworms himself. On the basis of his statement of what he received for his two crops of cocoons above what he might receive for the leaves themselves, the wage for the labor of his family plus compensation for the use of most of his home amounted to less than 45 cents a day for the two producing periods of about three weeks each. As pointed out in the previous chapter, it is possible for a woman alone to make between 50 cents and a dollar a day by weaving cloth, and the loom, though very bulky, does not so thoroughly monopolize the home as does the silkworm. It is true that much of the labor used in producing the cocoons could probably not be utilized profitably in any other way and in that sense anything that it may receive is clear gain. But the presence of so large a body of labor forced

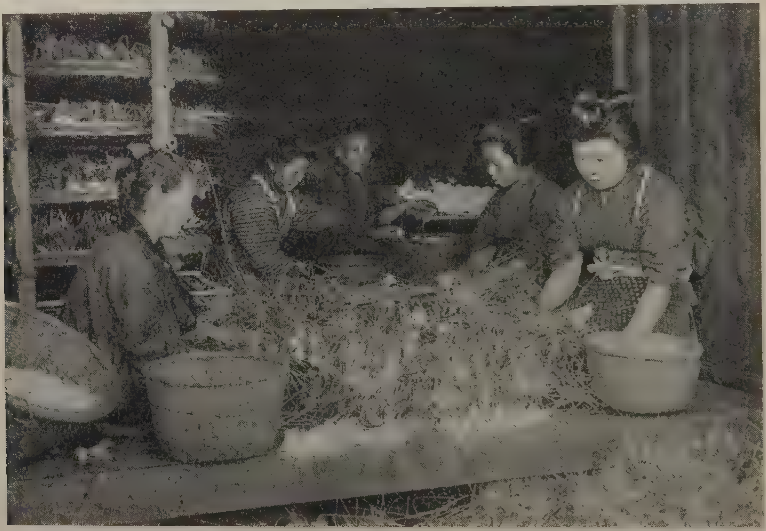

FIG. 84.—When the cocoons are spun, they must be separated from the straw by hand. (*Photograph by H. Suito, Tokyo.*)

to be content with so small a return for its efforts is evidence of the strongest sort of the poverty of the country and of the lack of economic opportunity.

The opinion seems to be firmly established in Japan that the silk industry, especially the rearing of the cocoons, can succeed only as a parasitic industry dependent upon labor that is poorly compensated, if at all. It seems so obvious that labor for which little is paid must be cheap labor that few dare to question the economic soundness of the system. Little consideration has been given to the possibility of a complete reorganization of the industry and the substitution, in the place of the present farm households, of larger establishments, more or less of the factory type, for the rearing of the cocoons. These larger establishments would undoubtedly have many advantages in greater efficiency, in the application of more scientific methods of rearing, in the improvement of quality, and in more economical marketing, but whether such advantages would be sufficient to offset the payment of economic wages to the labor can be determined only if the experiment is made on a comprehensive scale. The government sericulture stations, notably the one at Ueda, have been endeavoring to determine the ideal atmospheric conditions of temperature and humidity for the rearing of cocoons. Some of their experiments have shown very definite results, but they can be of little practical value as long as the cocoons are reared in the farm houses where conditions cannot be controlled.

There is one bit of evidence that indicates the promising possibilities of large scale rearing. Near Kumagaya, about 50 miles northwest of Tokyo, is the village of Nakase. It is in the midst of an area that is planted almost entirely in mulberry because the gravelly character of the soil does not permit the cultivation of rice even on the flat lands. The rearing of cocoons is the principal occupation of the district. As in other parts of Japan, they are reared in the farm households, but in the village they are also being raised in fairly large producing units. One producer visited in 1926 owned about 4 acres of mulberry land and during the busy season hired six or eight workers to assist in the rearing of the cocoons. A neighbor owned 10 acres of mulberry land and employed 18 workers, and sometimes as many as 30 workers in the very busy season. There were in the village many cocoon raisers employing 10 to 20 workers. The usual wage paid was 75 cents to one dollar per day plus food, a wage practically on the level of the Japanese scale for factory labor. Despite the relatively high wages, the producers were able to sell their cocoons to the wholesalers and filatures in competition with the farmers producing in their own homes with no outlay for labor. It is not a new development, for many of the Nakase producers outgrew the family system 40 to 50 years ago. It is a development that has arisen in this particular section probably because of the necessary dependence upon cocoon production. It is the main occupation and is not subsidiary to the cultivation of rice as is the case in most sections. It has had to be a self-supporting industry and there has been the incentive to realize every possible economy.

The failure of this large scale system to spread throughout Japan is difficult to explain. The persistence of the present system of cocoon rearing is certainly not an evidence of a high state of industrial advancement in the Japanese silk industry, the leading industry of the country. It is, on the contrary, an evidence of an absence of initiative and foresight on the part of the silk manufacturers. It is an evidence of the almost monopolistic control that Japan has had in the world silk market, stifling any effort toward a more efficient organization of the industry. It is also further evidence of the country's agricultural poverty, for it directs attention to the existence of a large body of labor content to keep alive a parasitic industry.

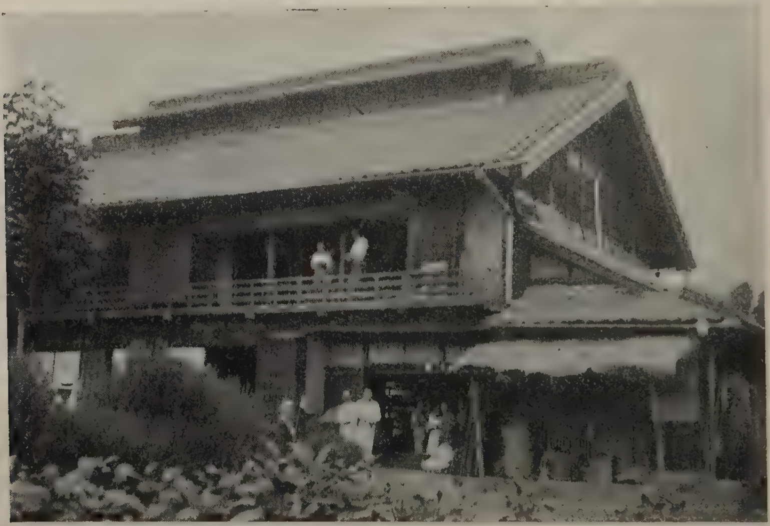

FIG. 85.—One of the larger establishments producing cocoons in Nakase village near Kumagaya.

THE MINOR IMPORTANCE OF THE SILK WEAVING INDUSTRY

Though raw silk is almost the only raw material for manufacture produced in Japan, it has not served as the basis for a manufacturing industry of major importance. Despite the encouragement that has been given to industrialization, Japan has made surprisingly slight progress in silk weaving. The raw silk is not consumed within the country. It supplies the looms of the United States and, to a less extent, of France, and has been instrumental in building up in those two countries a leading industry. During the five-year period ending with 1928, approximately 88 per cent of the raw silk output of Japan, by value, and 82 per cent, by quantity, was exported in its raw state.[1]

In most of the Japanese industrial reports, it is impossible to separate the weaving of silk cloth and of cloth of silk and cotton mixed, for most establishments make both, but even if the combined data are taken the total is not impressive. Fewer than 95,000 workers are employed in the factories weaving silk cloth and silk and cotton mixed, in comparison with over 162,000 workers in cotton weaving factories, 170,000 in cotton spinning, and over 430,000 in silk reeling.[2] There are in addition, however, probably 128,000 workers engaged in the weaving of such cloth in small establishments that cannot be considered as factories. They are domestic workshops, and their product is mainly in the narrow width for consumption in Japan. Of the cloth manufactured from the 18 per cent of the raw silk output retained in the country, only one-fourth, by value, is exported. Its value is approximately 17 per cent of the value of the raw silk exports.

The failure of the Japanese to develop the silk weaving industry is due in part to fundamental weaknesses in their industrial system and in part to circumstances over which they have no control. Silk manufacturing is a difficult industry for the newcomer, especially if the product is to be exported. Cotton cloth is a staple commodity. It has a wide demand in densely populated lands with little industrial development. Design is of no great importance, and the competition is between one export manufacturing country and another, and the market is chiefly concerned in securing the required goods as cheaply as possible. Silk cloth, on the other hand, is a luxury product, and the demand for it is elastic and must be stimulated through innovations in style and design. It has its principal market in the wealthier countries, and such countries, especially if they have a large population, are usually ambitious to develop their own manufactures. The raw silk is valuable and of little bulk and can be imported easily even from a great distance. The other handicaps that may face a silk weaving industry can be met largely through a sufficiently protective tariff. Since the product is a luxury product, the tariff can be very high. Once established, such an industry has one decided advantage in the home market, at least, over the more distant foreign producers, for in silk manufacturing style and design are especially important and both depend upon close contact with the market.

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.;* Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*

[2] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

With one notable exception, the countries of wealth and population have been able to develop some silk manufacturing. Great Britain, with her free trade policy, has refused to give to silk weaving any protection not accorded to other industries, and is almost entirely dependent upon imports. France, Germany, Switzerland, and Italy, because of an early start, low costs of production, and skill in design, have an industry that not only supplies the domestic demand but also provides goods for export.

The United States, though no raw silk is produced within its boundaries, now has an important silk manufacturing industry. It employed 128,000 workers in 1927 and its product was valued at $750,000,000.[1] It has had the advantage of the world's richest market and has enjoyed a virtual monopoly of that market, for it has been protected since its beginning by an almost prohibitive tariff, amounting to 55 per cent ad valorem in the Fordney-McCumber Tariff Act of 1922 and increased to from 60 to 70 per cent ad valorem in the Hawley-Smoot Act of 1930. In recent years, the imports of silk manufactures, including both cloth and wearing apparel, have amounted to approximately $40,000,000, or about 5 per cent of the American production. The tariff, however, has been of no assistance in promoting the foreign trade, for exports of silk manufactures have been little more than $15,000,000 annually, mostly hosiery.

The silk manufacturing industry of the United States with its protective tariff is probably the most serious obstacle that stands in the way of the development of an important silk weaving industry in Japan. The obvious market for such an industry, both because of proximity and because of purchasing power, would be the United States, but it is a market that is effectively closed. The Japanese manufacturer has little incentive to perfect more economical methods of production, for he knows that as his costs are lowered the American tariff will be raised to meet the new competition.

Of the small quantity of silk manufactures imported into the United States, Japan has supplied a part. For the five-year period ending with 1927, the United States secured from Japan on the average 41 per cent of its annual imports of silk tissues. But this item was not of any great importance in the export trade of Japan, for it averaged only about $9,000,000 per year. France supplied 25 per cent of the silk tissue, but because of her skill and reputation in style and design she has been able to market a part of her silk cloth as wearing apparel and as nettings and veilings. In the total imports of all silk manufactures into the United States, France contributed 41 per cent during the five-year period and Japan only 30 per cent.[1]

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[1] U. S. Bureau of Census, Census of Manufactures, 1927.

Japan has had even less success in the United Kingdom, an open market and the world's leading importer of silk manufactures. For the five-year period 1923 to 1927, the silk tissue imports of the United Kingdom averaged about $97,000,000 annually and of this amount France supplied 44 per cent, Switzerland 28.6 per cent, Italy 10.6 per cent, and Japan only $8,240,000, or 8.5 per cent. It will be noted that Japan sends even less silk cloth to this open market than to the United States with its tariff. In addition to the silk tissue, France exported to the United Kingdom silk lace valued at over $1,000,000 and large quantities of silk wearing apparel.[2]

In view of the greater success of France in the American market and in the British Isles, despite her less advantageous position in the supply of raw silk, it is evident that it is not the protective tariff alone that is responsible for Japan's slow progress in silk manufacturing. A second serious handicap is the distance separating Japan from the consuming markets both in space and culture. Up to the present, the Japanese manufacturers have made the mistake of attempting to imitate the goods found in the American market, but distance has made it impossible for them to keep pace with the constantly changing demand. Repeatedly, the Japanese representatives have carried designs back to Japan, but by the time the designs have been copied and the goods returned to America the fashion has changed. The hold of the French manufacturers, and of the American also, depends very largely upon their ability to create something new. They have even gone to the Orient for their designs and recently a New York department store was advertising French chiffons with "the delicate exotic patterns in which Nippon has excelled for centuries.[3] As long as the Japanese are content to imitate, they will be hopelessly outdistanced and will be able to send to this country only a small quantity of staple silk. If, however, they are able to create new designs springing from their own culture and do not abandon its beauties to Occidental exploitation, there is a possibility that they may be able to cut into the French trade to a considerable extent. Protective tariffs are much less effective in shutting out taste and culture as displayed in design and new varieties of cloth than in excluding goods produced at low costs. Such a change of policy on the part of the Japanese will occur only slowly, for it demands initiative and imagination, ever fresh and resourceful, and it is in those two qualities that Japanese industry of the present day has proven itself woefully weak. The Japanese industrial leaders apparently appreciate the situation, for recently the government has created experimental schools of design, and cloth designing is being taught in some of the technical schools.

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[1] U. S. Department of Commerce, Foreign Commerce and Navigation of the United States, 1923–1927.

[2] Annual Statement of the Trade of the United Kingdom, 1923–1927.

[3] *New York Times*, Mar. 10, 1930.

The future of the Japanese silk manufacturing industry, an industry that should be one of the most important of the country, is not promising. Protective tariffs limit its markets and it is not likely that they will be removed. A distance that cannot be annihilated even with the rapid progress in transportation will remain as a serious handicap. The only hope, apparently, lies in a radical revolution in Japanese methods of manufacturing and merchandising.

THE GROWTH OF COTTON SPINNING

Second to silk reeling, the most important factory industry of Japan is the spinning of cotton yarn. It is perhaps a more accurate index of the country's industrial progress than is silk reeling, for it is entirely a factory industry and is more completely divorced from agriculture. It was one of the earliest of the western industries to be introduced into Japan, the first spinning mill starting operation in 1863. The industry now employs 10 per cent of the factory workers of the country, and of the workers in the large establishments with more than 500 employees, over 25 per cent are in cotton spinning. In comparison with industrial Japan at the opening of the modern period, the development of the cotton industry has been remarkable, for there is a wide gap between the one small mill of 1863 and the more than 200 mills of the present employing over 200,000 workers.

In comparison with the development in otner countries, the growth is not so significant. Japan, in military and naval circles, is now associated with the United States and England, but no better evidence than the cotton industry is required to indicate that no such parity exists in industrial development. In 1929, Japan had approximately 6,500,000 spindles, or less than 4 per cent of the world total, and ranked seventh among the countries of the world. She was surpassed not only by the acknowledged industrial leaders—the United States, the United Kingdom, and Germany—but also by France, Russia, and India. The United States had over five times as many spindles as Japan and the United Kingdom more than eight and a half times as many. Bristol County, Massachusetts, with an area of only 567 square miles and a population of 359,000, had 6,144,328 spindles in 1929,[1] or almost the same number as there were in all of Japan.

[1] U. S. Bureau of Census, Bulletin 166, Cotton Production and Distribution, Season of 1928–1929.

Both the United Kingdom and the United States are so much older industrially and are so much more important in the spinning industry that little is to be gained by comparing their development with that of Japan. A much fairer standard of comparison is the growth of cotton spinning in two of the American states—North Carolina and South Carolina, the former with one-third the area of Japan and the latter with one-fifth, and both with much smaller populations.

The comparison is especially apt because the industry began in Japan and in the two states at about the same time and because they now have almost exactly the same number of spindles. By 1880, each of the three units had sufficient spindles for not more than one or two fair sized modern mills. In that year, the population of North Carolina was less than 4 per cent and of South Carolina less than 3 per cent of that of Japan. As shown by Figure 86, all three units were about on a parity in number of spindles by 1900. During the next 20 years, North Carolina and South Carolina advanced at a somewhat more rapid rate, but in recent years, due to the stimulus of the World War and the abolition of midnight labor in the Japanese mills, the Japanese increase has been accelerated and Japan had passed both South Carolina and North Carolina in number of spindles by 1928. The Japanese industry had overexpanded, however, temporarily perhaps, for from May, 1927, to June, 1929, 1,125,000 spindles, or 18.5 per cent of the total, had been sealed by the Japan Cotton Spinners' Association to restrict output, and in 1930, despite the curtailment of working hours due to the abolition of midnight labor, the Association found it necessary to seal first 17.2 per cent, and later 27 per cent of the spindles.[1] In the same years, about 1 per cent of the North Carolina and South Carolina spindles were inactive. It would seem that there are more spindles in actual operation in each of the two American states than there are in Japan. It may be objected that the comparison in number of spindles between Japan and the Carolinas is unfair, since in Japan the mills are operated day and night, but night work is also the general practice in the Carolinas. In the period of 49 years covered by Figure 86, during which the growth of the spinning industry has been so nearly identical, the population of South Carolina has increased by only 868,000, of North Carolina by 1,538,000, and of Japan by over 28,000,000.

The development of the Japanese cotton industry began almost a century after the European Industrial Revolution, and spinning machinery, perfected and ready to install, could be secured from the western countries. Despite that important advantage, Japan's progress has been much slower than the progress of England even in the experimental stage of the industry. By 1836, within less than 60 years of the date of the invention of Crompton's spinning mule, England had

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[1] The installation of spinning machinery has continued and on May 1, 1930, according to *Trans-Pacific*, *op. cit.*, June 19, 1930, Japan had 6,910,000 spindles. If allowance is made for the 27 per cent of the capacity, or approximately 1,866,000 spindles, sealed through the voluntary agreement of the industry, there were only 5,044,000 spindles in actual operation, or about 600,000 less than in 1929.

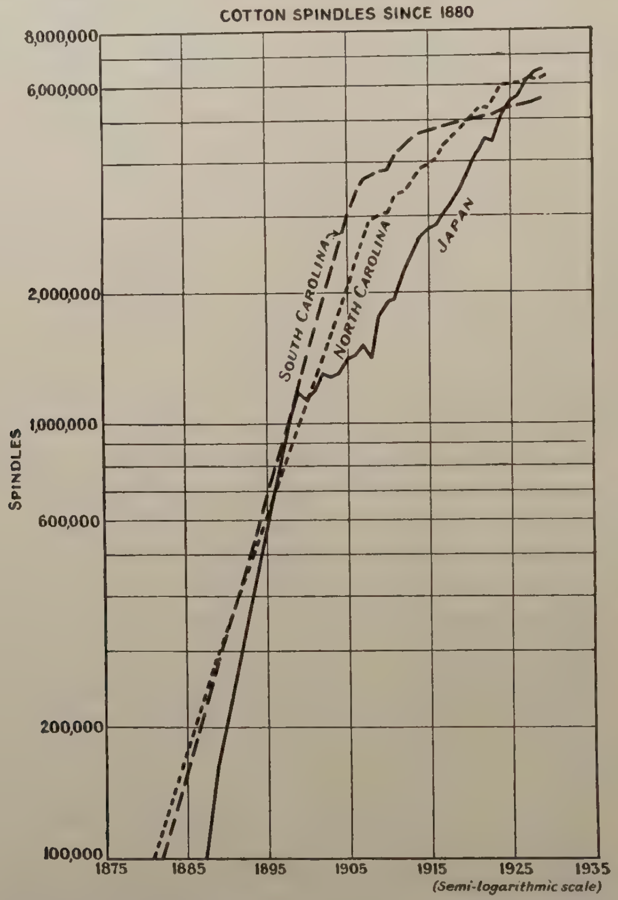

FIG. 86.—The increase in the number of cotton spindles in Japan since 1880 has been almost identical with the increase in North Carolina and South Carolina.[1]

10,500,000 spindles,[2] or 4,000,000 more than Japan now possesses 67 years after the opening of the first mill. Even India has progressed about as rapidly as Japan in cotton spinning, for that country now has 8,700,000 spindles[1] though they are not operated at night and the actual output of yarn is therefore less than the Japanese output.

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[1] Data from U. S. Census of Manufactures, *op. cit.*, 1905; U. S. Cotton Production and Statistics, *op. cit.;* H. Satoh, *op. cit.;* Japan, Statistical Report of Department of Agriculture and Commerce, *op. cit.*, 1901–1920; Bank of Japan, Economic Statistics of Japan, 1927; International Labour Office, Industrial and Labour Information, Geneva, Vol. 26, No. 4, April 23, 1928; Mitsubishi Goshi Kaisha, Economic Research Department, *Monthly Circular*, August, 1929.

[2] ANDREW URE, The Cotton Manufacture of Great Britain, 2 vols., London, 1861.

THE POSITION OF COTTON WEAVING

In recent years, the Japanese cotton weaving industry has attained a considerable degree of world importance, for more cotton cloth is exported from Japan than from any other country with the exception of the United Kingdom. Most of the cloth is of the coarser varieties suited to the Asiatic market. The surplus of cloth available for export is due principally to the large output, but it is also due to the lower standard of living and to the consequent smaller per capita consumption of cotton cloth in Japan than in the western countries despite the position of cotton as the most widely worn fabric. Though comparable statistics of cloth production in the different countries are difficult to obtain, it would seem, on the basis of yarn consumption, that Japan does not rank quite as high in output as in world trade. She is outranked in output not only by the United Kingdom, but by the United States, India, and perhaps by Germany, a slightly smaller consumer of yarn but a manufacturer of finer cloth.

The progress in the cotton industry has been remarkable, and cotton spinning and cotton weaving are with silk reeling the most successful industries of modern Japan, but the output of cotton cloth and its export cannot be taken, without qualification, as a measure of industrialization, for cotton weaving has become a factory industry only to a limited extent. Though most of the spinning companies have their weaving sheds, a large part of the cloth, as the previous chapter has indicated, is still produced in small workshops and in homes.

THE WEAKNESS OF THE IRON AND STEEL INDUSTRY

In the industries, other than the textiles, the progress of Japan has been much less significant. Japan is especially weak in the iron and steel industry, an essential and basic industry for manufacturing development. It provides the sinews of the other industries and of transportation. It must be depended upon for warships and munitions. It is an industry of such significance that the output of pig iron may be taken as a measure of a country's industrial strength. Without the capacity to produce iron and steel in large quantities, no nation has ever become a manufacturing nation of first rank.

As pointed out in an earlier chapter, the Japanese did some work in iron and steel before the country was opened to the West, but it was limited to the making of weapons and armor and a few cooking utensils. There was no manufacture of machinery, and practically no use of iron and steel in construction. The metal was the product of small, primitive furnaces dependent upon local deposits of iron ore, often magnetic sands, and using charcoal as fuel.

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[1] Bombay Millowners' Association, Annual Report 1927.

The native iron industry was one of the first to be destroyed by the import of foreign products. Iron and steel could be brought in from abroad so much more cheaply than it could be made at home that it was impossible for the Japanese industry to compete, and it quickly disappeared. Strenuous efforts have been made to establish a modern industry, especially since the war with China in 1895. Generous subsidies have been paid to private manufacturers, and Japanese producers are well protected not only by a tariff but by the freight differential that must be paid on iron and steel goods imported from the distant European or American producing centers.

Despite the encouragement given to private enterprise, over one-half of the workers engaged in the primary refining of metals are employed in the huge Imperial Steel Works built by the Japanese government at Yawata, in northern Kyushu, and that plant produces between 75 and 80 per cent of the total pig iron output of Japan Proper and about 58 per cent of the steel.[1] The private plants are few in number and small in size. Except in the very unusual years of the World War, they have had a precarious existence.

The Imperial Steel Works, though it is by far the largest unit of the Japanese steel industry and has had the support of the government, has not been an unqualified success. It is a vital link in the Japanese national defense, but as an economic, self-supporting enterprise its status is questionable. Built by the government with government funds, the Imperial Steel Works is not called upon to yield profits to meet the claims of shareholders. During the first 10 years of its existence, there was a constant drain on the public treasury to meet operating expenses, the annual losses ranging from $500,000 to almost $875,000. The World War greatly stimulated the demand for steel in Japan and at the same time foreign sources of supply were effectively cut off. The profits of the government plant totaled $7,000,000 in 1915, $15,500,000 in 1916, $23,000,000 in 1917, and $29,000,000 in 1918. With the industrial recovery of the steel producing countries of Europe, the old difficulty of competition with the West has returned. Despite government aid to meet European dumping and the protection of the tariff and the freight differential, the profits of the steel plant declined greatly and in 1923 amounted to only $219,000, in 1924 to $434,000,[2] and in 1927 to $1,000,000.[1] According to a newspaper dispatch that it has been impossible to verify, the profits for the fiscal year ending March 30, 1928, were $5,000,000, and for the year ending March 30, 1929, $7,700,000.[2] It is difficult to understand such profits during a period when the Japanese steel industry has been appealing to the government for assistance. If the profits have been reported correctly "it is probable that no allowance has been made for interest charges on the investment and it is doubtful if adequate depreciation has been provided for."[3] In the construction of the plant, the government has expended a total of $70,000,000 and, in addition, the sum of $25,000,000 has been advanced to the Hanyehp'ing Iron and Coal Company, the company controlling the Tayeh iron ore deposit on the Yangtze River from which the Imperial Steel Works has been securing the major part of its iron ore. In view of the unsettled political conditions in China and the uncertain economic position of the Hanyehp'ing Iron and Coal Company, it is doubtful whether any of this loan can ever be recovered.

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[1] U. S. Bureau of Foreign and Domestic Commerce, Trade Information Bulletin, 612. The production of Iron and Steel in Japan, J. H. Ehlers, 1929.

[2] Summary of the Progress of the Yawata Steel Works (in Japanese), published by the Japanese Government, 1924.

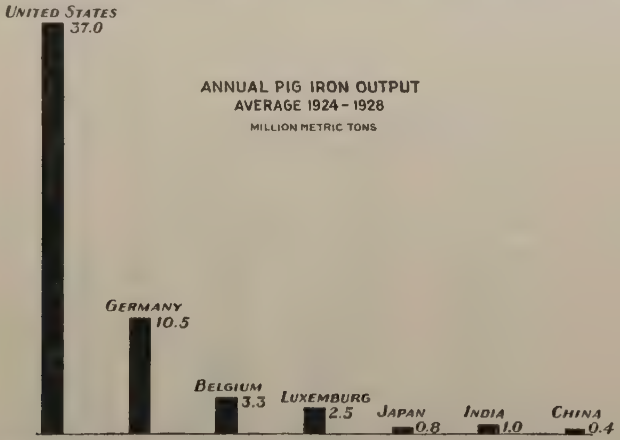

FIG. 87.—The annual pig iron output of Japan is less than that of Belgium, Luxemburg, and India, and far below that of the great manufacturing nations.[4]

The iron and steel industry of Japan is very small in comparison with that of the other manufacturing countries. The pig iron output, as shown in Figure 87, is far below that of Belgium and Luxemburg. It is even less than the output of India. For the five-year period 1924 to 1928, the pig iron output of Japan Proper averaged 808,000 metric tons, or only 25 per cent of the output of Belgium and 32 per cent of the output of tiny Luxemburg. The showing is even less impressive on a per capita basis, since the average annual pig iron output of Japan is only about 30 pounds per capita in comparison with 310 pounds for Germany, 700 pounds for the United States, and over 900 pounds for Belgium. It is difficult to arrive at a satisfactory comparison of the output of steel, for the statistics vary widely with the source; but if the statement most favorable to Japan is accepted, the output of steel ingots and castings for the five-year period 1924 to 1928, averaged 1,289,000 metric tons, or 39 per cent of the steel output of Belgium and 52 per cent of the output of Luxemburg.[1]

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[1] *Trans-Pacific*, *op. cit.*, p. 18, Nov. 19, 1927.

[2] *Op. cit.*, p. 17, June 6, 1929.

[3] The Production of Iron and Steel in Japan, *op. cit.*, p. 32.

[4] Data from International Statistical Year Book, *op. cit.*, 1929; U. S. Commerce Year book, Vol. II, *op. cit.*, 1929.

The iron and steel capacity of Japan, small as it is, was reached only as a result of the somewhat unreasoned expansion of the industry arising from the World War. At least one of the larger private mills constructed during the war was idle for several years after its completion and there is scarcely an iron and steel plant in Japan working at full capacity. The blast furnace capacity of Japan Proper was estimated to be 1,088,680 tons in 1927, and the open-hearth steel capacity 2,208,000 tons; but the pig iron output for that year was only 895,000 tons, and the steel ingot output about 1,600,000 tons.[2] The failure of the plants to produce up to capacity is not due to the limitation of the demand within the country, for each year Japan imports considerable quantities of pig iron, steel, and steel products. In 1927, for example,

TABLE X.—THE PIG IRON SUPPLY OF JAPAN PROPER
(Metric tons)

Year	Production, Japan Proper[1]	Imports from foreign countries[2]	Korean exports to Japan[3]	Total supply	Percentage Japanese production of supply
1918	582,758	225,100	41,421	849,279	68.6
1919	595,518	283,140	62,387	941,045	63.3
1920	521,036	348,660	40,743	910,439	57.2
1921	472,725	227,100	48,055	747,880	63.2
1922	550,845	327,960	80,002	958,807	57.5
1923	599,698	346,020	81,916	1,027,634	58.4
1924	585,930	441,960	73,513	1,101,403	53.2
1925	685,178	316,380	83,857	1,085,415	63.0
1926	809,624	399,639	102,548 est.	1,311,811	61.6
1927	895,246	472,947	100,542 est.	1,468,735	61.0
1928	1,092,536	569,215	144,321 est.	1,806,072	60.5

[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.
[2] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*
[3] Korea, Tables of Trade and Shipping, 1918–1925; 1926–1928 estimates based on total exports of pig iron from Korea in U. S. Commerce Yearbook, Vol. II, *op. cit.*

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[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928; International Statistical Year-Book, *op. cit.*, 1928.

[2] The Production of Iron and Steel in Japan, *op. cit.*

473,000 tons of pig iron and 900,000 tons of ingots and milled steel products[1] were imported though the blast furnaces were operating 200,000 tons below capacity and the ingot and casting output was approximately 600,000 tons below the capacity of the open-hearth furnaces. There has been a considerable increase in the pig iron output of Japan since 1918, as is shown in Table X, but the Japanese furnaces are providing only about 60 per cent of the total supply of the country and in recent years the ratio of imported pig iron has been increasing. At the same time, stocks of unsold pig of Japanese manufacture are accumulating, since the Japanese iron makers find it difficult to compete with the import prices. The imports are to be explained by the higher costs of production that continue in Japan despite the government subsidies and the efforts to improve the technique. Cost figures are not available, but in 1928 the average monthly price of round steel bars at the Imperial Steel Works ranged from $43.50 to $51 per ton and of plates from $50 to $52.50. The prices of the German products, f.o.b. ship at port of dispatch, ranged from $25.25 to $33 for the bars and from $31.85 to $35 for the plates.[3] The tariff and freight differential were apparently not sufficient to offset completely the lower German prices, for in 1927, 347,000 tons of steel products were imported into Japan from Germany. In addition, 554,000 tons were imported from other countries, chiefly from the United States, England, and Belgium.[4]

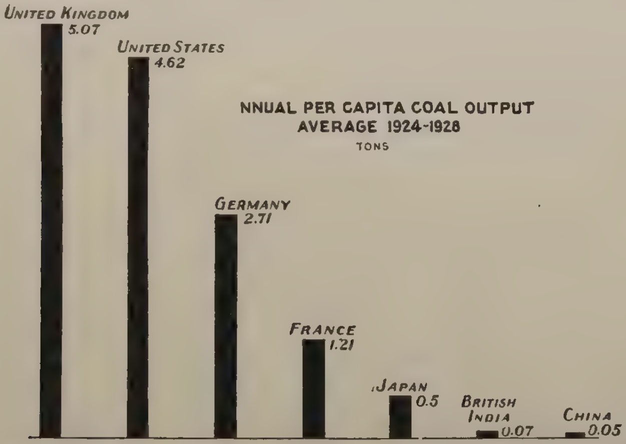

FIG. 88.—The per capita coal output of Japan is very small in comparison with that of the United States and of the industrial countries of western Europe.[2]

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[1] Mitsubishi *Monthly Circular, op. cit.*, June, 1929, p. 12.

[2] Data from League of Nations, The Problem of the Coal Industry, 1929. Includes lignite in terms of coal. Average for China is 1921–1925. Population figures for 1926 except India, which is 1921.

[3] Mitsubishi *Monthly Circular, op. cit.*, June, 1929.

[4] *Op. cit.*

CONSUMPTION OF POWER

In the present day, the industrial stature of a country is measured by its consumption of power, especially of coal. Japan is one of the least of the coal consumers. The annual output of the Japanese mines is approximately 30,000,000 tons. Imports and exports very nearly balance and can be ignored. The annual per capita output of coal for a number of countries is shown in Figure 88. Japan's per capita consumption for all purposes is approximately ½ ton per year in comparison with a consumption of 4.4 tons in the United States, 4.4 tons in the United Kingdom, 2.2 tons in Germany, 3.9 tons in Belgium, and 1.6 tons in France.[1] Of the European countries at all significant in manufacturing, only Italy with 0.23 tons per capita consumes less coal than Japan and Italy has developed per capita almost twice as much hydroelectric power.

Japan possesses large water power resources for a small country and has made good progress in their development, but the present per capita consumption of hydroelectric power is by no means sufficient to offset the small consumption of coal and to give to Japan a position among the leading power consuming countries. In Table XI is presented the total and the per capita developed water power of the 10 ranking countries (see also Figure 97). In the total developed, Japan stands fourth, but in per capita power she is outranked by seven countries and is about equal to Spain, a country with small industrial pretensions. Japan does have a greater per capita development of water power than

TABLE XI.—THE TEN LEADING COUNTRIES IN DEVELOPED WATER POWER, 1926[1]

Country	Total horsepower	Horsepower per capita
United States	11,721,000	0.100
Canada	4,556,000	0.479
Italy	3,412,000	0.084
Japan	2,830,000	0.047
France	2,305,000	0.056
Switzerland	2,142,000	0.541
Norway	1,521,000	0.546
Sweden	1,398,000	0.230
Germany	1,100,000	0.018
Spain	1,000,000	0.045

[1] Taken from table in U. S. Commerce Yearbook, Vol. II, *op. cit.*, 1929. The figures for developed water power represent the rated capacity of water wheels or turbines installed. Per capita estimates are based on population returns in same volume. Japanese figure from Mitsubishi *Monthly Circular*, *op. cit.*, March, 1929.

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[1] Estimate based on statistics in U. S. Commerce Yearbook, Vol. II, *op. cit.*, 1928.

Germany, and also than the United Kingdom with only 0.006 horsepower per capita, but those two countries are such large consumers of coal that when all possible allowances are made for their deficiencies in water power, they still stand far above Japan in power consumption. In expressing water power in terms of coal consumption, 1 horsepower developed continuously for 1 year is considered the equivalent of from 3 to 9 tons of coal, depending upon the efficiency of the steam plants. If a conversion figure of 6 tons is accepted, the annual per capita power consumption of Japan from the two sources, water power and coal, is equivalent to 0.78 tons of coal, of Germany to 2.3 tons, of the United Kingdom to 4.44 tons, of France to 1.94 tons, of the United States to 5 tons, and of Italy to 0.73 tons.

The discussion of power consumption might be completed with a comparison of the Japanese consumption of petroleum with that of the other countries, but Japan is a small consumer of petroleum, and such a comparison would only serve to place the country in a still lower ranking as a consumer of power.

THE POOR REPUTATION OF JAPANESE GOODS

The rather dubious reputation of Japanese goods and the mistrust of Japanese exporters and their methods are further indications of the limitations of the present industrial development. The subject is discussed here with no intention of casting reflections upon Japanese character or moral qualities, but solely as an evidence of the country's industrial immaturity.

During the World War, with British, German, and other European trade effectively cut off, Japan had an unusual opportunity to extend her markets in southeastern Asia. Her trade did increase very substantially, but with the postwar recovery of the European nations many of the consumers have returned to their former sources of supply because of the general dissatisfaction with Japanese goods. The poor quality was undoubtedly due in part to inferior manufacturing technique and to the prevalence of unsupervised domestic industries, but it was also due to the sharp trading methods of the Japanese exporters. Throughout southeastern Asia, from India to the China coast, many stories are current of Japanese overshrewdness and chicanery, of matches that would not light, of packing cases received only partially filled, of cloth poorly dyed and short in measurement. The export of straw braid to Europe and America declined considerably because of the poor quality of some of the goods. The doctrine of *caveat emptor* still prevails, and some Japanese business men have failed to realize that if the buyer must be constantly on his guard he will seek other markets where there can be more confidence in the product. The label

"Made in Japan" was originated to advance Japanese trade, but it has come to suggest goods of cheap and inferior quality.

Every country in its industrial growth seems to pass through this period of trickery and deceit. As it progresses, it becomes, not more honest, but more conscious of the commercial value of honesty. Japan at the present time is in much the same stage of industrial growth that New England was in during the early part of the nineteenth century when the Yankee peddlers considered it good business practice to sell wooden nutmegs, basswood hams, and other goods perhaps less fraudulent in character but certainly very inferior in quality. The realization that honesty is good business is as much an evidence of industrial and commercial maturity as are large scale enterprises, the use of machinery, the division of labor, and high powered salesmen.

The Activities of the Trade Associations

Many of the Japanese leaders are fully aware of the value of a good reputation and are making every possible effort to raise the level of business integrity and to improve the quality of Japanese goods. The government is cooperating in a very positive fashion. Legislation has been enacted making compulsory the inspection of certain goods intended for export. Provision has also been made for the organization of trade associations, and in some industries membership in an association is compulsory. In 1928, there were 869 local trade associations representing some 113 different manufacturing industries. The more important were united into 31 national federations. There were, in addition, 76 export manufacturers' associations including all the more important industries producing for export.[1]

The principal function of the trade associations is to establish and to maintain a high standard of quality for the products of their members. The goods are examined, and articles intended for export are given a much more rigorous inspection than those intended for domestic consumption. In the village of Sano, for example, every piece of cloth intended for export is examined for its length, its condition, and its dye by the inspectors of the Sano Cloth Trade Association; and of the cloth intended for use in Japan, only one piece in ten is examined. Pieces of unsatisfactory quality are rejected and returned to the manufacturer. In general, all cloth produced in the small workshops is subject to such inspection before it is sold. Much the same procedure is followed in the pottery industry, in silk weaving, in the manufacture of matches, straw braid, umbrellas, and lanterns, and in many other industries. The principal purpose of the Silk Conditioning House, recently completed at Yokohama with funds supplied partly by the government and partly by the Raw Silk Association of Japan, is to improve the quality of the raw silk through a careful inspection of its strength, evenness, spinning qualities, and moisture content.

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[1] Statistics of Department of Commerce and Industry, *op. cit.*, 1928.

The efforts of the government and of the trade associations, if they are continued conscientiously, may be expected ultimately to work in two directions. They will do much to dispel the present suspicions of Japanese business ethics and to establish for Japanese goods abroad a higher reputation for quality. In time, they will inculcate in the minds of the manufacturers and merchants an appreciation of the value of dependable quality and of honest methods. Such changes take place slowly, but as they progress they will mark the transition of Japan from industrial and commercial youth to maturity.

FOREIGN TRADE AS A MEASURE OF INDUSTRIALIZATION

There remains one other measure of the progress of Japan in industrialization—the character and the balance of her foreign trade. Trade and markets in their bearing upon future industrial possibilities will be discussed at length in later chapters, and it will be possible to present here only a brief summary as an index of what has been accomplished.

Japanese trade has increased tremendously in the last half century, and to this increase industrialization has made a substantial contribution. During the early years of the modern period, wholly manufactured goods were of slight importance, and for the period 1871 to 1875, they constituted only about 7.6 per cent of the value of exports. In the four-year period 1924 to 1927, the value of manufactures had increased to a little less than 40 per cent of the total value of all the Japanese exports.[1] The relative increase has been large, but the ratio of manufactured goods to the other exports is small in comparison with the ratio in the leading manufacturing countries. In the United Kingdom, for example, 79 per cent of the value of exports is contributed by manufactures.[2]

The growth in Japanese trade has also been due to the increase in the export of raw silk. With the opening of the country to foreign trade, raw silk soon became the most important export, and for the five-year period 1871 to 1875, it constituted 35 per cent of the total value of the exports. In later years, it has not only maintained its relative importance despite the increasing volume of trade, but it has made some gain. In the five-year period 1924 to 1928, raw silk constituted 37 per cent of the total exports.[3] Despite the progress of industrialization, the single item, raw silk, is almost as important in Japanese export trade as all the manufactured goods combined—including cotton cloth, iron and steel goods, novelties, pottery, and clothing. And raw silk is not an evidence of a high degree of industrialization, for, as earlier paragraphs have emphasized, it is the product of a simple mechanical process and should be regarded as a raw material. It must be much more highly fabricated before it is ready for consumption.

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] Annual Statement of the Trade of the United Kingdom, *op. cit.*, 1923–1927.

[3] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

Though both raw silk and manufactured goods have contributed to a very striking increase in the value of exports since 1870, Japan has not been able to maintain a favorable balance of trade. In the 61 years for which trade statistics are available, exports have exceeded imports in value in only 20 years and since 1895, in only 6 years, four of which were during the World War.[1] Japanese industrialization has been in progress for 75 years, and there has been a considerable development of manufacturing; but it has not been sufficient to provide the manufactured goods both for home consumption and for export to balance the Japanese foreign trade. At times, striking increases in production and in foreign trade have occurred, but they have been stimulated by influences external to Japan that will be discussed in the next chapter.

[1] *Op. cit.*

CHAPTER XIII

THE EFFECTS OF THE WORLD WAR ON INDUSTRIALIZATION

WARS and the fear of wars have played an important part in bringing Japanese manufacturing industries to their present state of development. Industrialization was begun as a weapon against possible aggression from a foreign nation, and each of the three wars in which Japan has engaged in the modern period—the war with China in 1894–1895, the Russo-Japanese War of 1904–1905, and the World War—was a powerful stimulus to industrial expansion. In the intervening years of peace, growth has proceeded at a much more leisurely rate or has stopped completely.

THE EXPANSION OF INDUSTRY

The World War was especially effective in its encouragement of industrialization. It involved Japan only to a limited extent in the actual hostilities, but it created a huge home market for munitions and uniforms and, through the disruption of European industries and world shipping, it freed Japan, for the time being, from the competition of European goods in her domestic markets and opened to Japanese trade the markets of the countries of the Asiatic mainland previously served by European manufacturers. There was even an increase in the export of Japanese goods to Europe, to North and South America, and to Australia.

The first reaction to the war was a severe business and industrial depression that continued through the last half of 1914 and into 1915. Stock prices were demoralized, there were many failures, and in almost every industry the curtailment of output was necessary. Finally, the full effect of the war upon the demand for goods and upon the trade of countries outside the zone of conflict became evident and then the recovery began. It was rapid and by the time of the Armistice, practically every Japanese factory industry had had a substantial growth and many new industries had been established. Within a period of three or four years, greater progress in industrialization had been made than in the previous decade.

It is difficult to secure a satisfactory statistical measure of the expansion, since there seems to have been in the years 1914 to 1918 a number of radical changes in the methods of collecting government statistics. Much of the available data for 1913, the year that should properly serve as a base year, are not comparable with the data for later years, and if 1914 is used as a base, even though the data are comparable the rate of increase is somewhat exaggerated by the fact that 1914 was a depression year.[1]

Between 1914 and 1919, the number of workers in factories employing more than five increased from 1,086,000 to 1,777,000, or by 63 per cent. A period of 10 years had been required between 1904 and 1914 to accomplish a similar percentage increase on a much smaller base. The power developed by prime movers for industrial purposes increased by 34 per cent and the capacity of electric motors by 206 per cent, an increase due in part to the expansion of manufacturing and in part to the electrification of existing industries. The increase in capital invested is often cited as a measure of growth, but it is an especially unsatisfactory index both because of the inaccuracies in the collection of the data and because a large part of the increase is due to the inflation of prices and the depreciated purchasing power of the yen. The real increase between 1915 and 1919 in the paid-up capital in joint-stock companies engaged in manufacturing, though undoubtedly great, was therefore something less than the apparent increase of 160 per cent shown in the official government reports.[2]

The consumption of coal, though its use is not confined to manufacturing, may be taken as an index of industrial activity. The Japanese coal reserves are not large, and new mines cannot be opened in response to demand as readily as they can in the United States, but between 1913 and 1918 the consumption of coal increased by 47 per cent, partly through a curtailment of exports, but more largely through an increase in the output of the Japanese mines.

For the measurement of the expansion of specific industries, the data are more complete and more accurate. In the cotton spinning industry, there was an increase between 1913 and 1918 of 44 per cent in the number of spindles and of 23 per cent in yarn output. The output of raw silk increased by 55 per cent. Other industries showed a similar growth, but the most spectacular expansion occurred in the iron and steel industry. In textiles, Japan was practically self-sufficient before the outbreak of the war, and produced a surplus for export, but in iron and steel the country was completely dependent upon imports for many products and partially dependent for others. About one-half of the total consumption of pig iron and three-fourths of the consumption of steel were imported.[1] Germany and England were two of the principal sources of supply and both were quickly and effectively cut off, the one by blockade and the other by the huge demand for iron and steel at home and by the Allies, and by the scarcity of shipping. At the outbreak of the World War, Great Britain placed an embargo on the export of iron and iron manufactures. Japan was suddenly thrown upon her own inadequate industries for her requirements of iron and steel. After the depression of the early months of the war, there was a great increase in the demand for iron and steel in the making of munitions, in shipbuilding, and in the expansion of industries. Prices mounted rapidly. The price of pig iron rose from an average of less than $24 per ton for 1915 to $250 per ton in September, 1918. There was a similar increase in the price of steel.[2] In the meantime, there had been but little change in wages and, since a large part of the raw materials was being delivered on long term contracts, the cost of production remained substantially at the prewar level. Profits were accordingly very high and in an industry that had always had a most precarious existence and had depended upon the government for subsidies and other forms of assistance, fabulous dividends were paid (see Table XII). The profits of the Imperial Steel Works for the four years 1915 to 1918 were sufficient to cover the initial construction costs though the plant had had to depend upon the national treasury to meet its annual deficit in almost every year since it started operations in 1901.

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[1] For a detailed discussion of the effects of the World War see Kokujiro Yamasaki and Gotaro Ogawa, Effects of the World War upon the Commerce and Industry of Japan. Published for the Carnegie Endowment for International Peace, Yale University Press, 1929.

[2] Japan, Department of Agriculture and Commerce, Section of Statistics, Statistics of Agriculture, Industries, and Commerce, 1923.

To stimulate further the establishment of the steel industry and perhaps in response to the American war embargo on the export of iron and munitions, a law was promulgated by the Japanese government in July, 1917, exempting newly constructed iron or steel plants from business and income taxes for a period of 10 years and permitting plants with a capacity of 35,000 tons or more per year to import ores and construction materials free of duty.[3] The existing steel plants were pushed to the very limit of their capacity and new plants were quickly built with no regard to costs of construction. In some instances, old plants were purchased in America and reerected in Japan.

The Japanese steel industry of the present day is a product of the World War. Before the war, there were in Japan only 8 iron and steel plants with a capacity of over 5,000 tons per year and 42 plants with a capacity of less than 5,000 tons. Of the larger plants, the Impe-

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[1] YAMASAKI and OGAWA, *op. cit.*, pp. 225–226.

[2] *Op. cit.*, p. 230.

[3] *Japan Advertiser*, *op. cit.*, p. 7, July 26, 1917, quoting law as published in *Official Gazette*, July 25, 1917.

TABLE XII.—DIVIDENDS OF JAPANESE IRON AND STEEL INDUSTRY, JULY TO DECEMBER, 1918[1]

Name of Company	Rate of Dividend, Per Cent
Hokkaido Seitetsu Kabushiki Kaisha	10
Kobe Seiko-jyo	50
Kabushiki Kaisha Nihon Juko-jyo	60
Tanaka Mining Company	4
Kabushiki Kaisha Oshima Seiko-jyo	25
Tokyo Kozai Kabushiki Kaisha	15
Nitto Seiko Kabushiki Kaisha	20
Kabushiki Kaisha Nihon-jyo	15
Fuji Seiko Kabushiki Kaisha	30
Nihon Kokan Kabushiki Kaisha	50
Kabushiki Kaisha Sumitomo Juko-jyo	5
Osaka Seitetsu Kabushiki Kaisha	20
Fujita Mining Company	5
Kuwahara Tetsuko Kabushiki Kaisha	40
Nihon Kosokudo-ko Kabushiki Kaisha	10
Takata Mining Company	7
Sanyo Seitetsu Kabushiki Kaisha	20
Nihon Tokushu-ko Goshi Kaisha	5
Tobata I-mono Kabushiki Kaisha	15
Kabushiki Kaisha Yasugi Seiko-jyo	16
Kuri-no-ki Tezzan Kabushiki Kaisha	100
Sennin Seitetsu-jyo	60
Chugoku Seitetsu Kabushiki Kaisha	50
Tokyo Seitetsu Kabushiki Kaisha	30
Tokai Kogyo Kabushiki Kaisha	14
Osaka Teppan Seizo Kabushiki Kaisha	20
Teikoku I-mono Kabushiki Kaisha	20
Kabushiki Kaisha Denki Seiko-jyo	30
Yonago Seiko-jyo	10
Toyo Seiko-jyo	10
Nihon Kotetsu Kabushiki Kaisha	16
Okura Mining Company	10
Tokyo Sen-tetsu Kabushiki Kaisha	20
Teikoku Seibyo Kabushiki Kaisha	20

[1] YAMASAKI and OGAWA, *op. cit.*, pp. 233–234.

rial Steel Works, built and operated by the government, was by far the most important. It produced 74 per cent of the pig iron output and 85 per cent of the steel products output of the country in 1913. Many of the other plants owed their existence to government contracts for the army, navy, or railroads. By 1918, the number of the larger plants had increased to 14 and of the smaller plants to 166, and 3 plants with capacities of more than 5,000 tons a year had been built in Korea and Manchuria.[1] The output of pig iron increased from 240,000 metric tons in 1913 to 583,000 tons in 1918, or by 143 per cent,[2] and the output of rolled steel, forgings and steel castings from 255,000 tons to 550,000 tons, or by 116 per cent.[1] Though there had been an expansion of the Imperial Steel Works, the greater part of the increase in production was due to the building of private plants. The government plant in 1918 contributed only 46 per cent of the output of pig iron in Japan Proper and 57 per cent of the output of steel products.

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[1] YAMASAKI and OGAWA, *op. cit.*, p. 229.

[2] The Production of Iron and Steel in Japan, *op. cit.*

THE POSTWAR DEPRESSION

The expansion of industry was not checked immediately with the signing of the Armistice. The impetus furnished by the World War spent itself slowly and, though a few industries fell into difficulties within a few months, the number of factory workers continued to increase through 1921, and for a time there was no interruption to the general prosperity. But the blow, though delayed, was severe when it fell. With the rehabilitation of the European industries on a peace basis and the recovery of world trade from the chaos of the war years, Asia could not remain a closed market, and Japan was forced once again to meet severe competition both in her own markets and in the Asiatic countries. It was soon evident that the recently won export markets could not be retained undiminished and that manufacturing capacity had been extended far beyond the possible demand for manufactured goods. There was a general industrial depression, and the downward trend of business was almost as precipitate as had been the rise during the war. Prosperity and generous dividends gave way to diminished output and the contraction of industry. The number of factory workers declined and did not return to the 1921 level until 1926. The output of cotton yarn remained below its high point of 1918 until 1925, and the 1919 consumption of coal was not equaled again until 1924. There were numerous failures, and other concerns were able to weather the period of distress only by resort to the most drastic measures. Appeals were made to the government for subsidies or for loans. Output was curtailed, and agreements were made for the fixing of prices. Dividends were reduced or passed, and many companies attempted to solve their financial difficulties by writing off a part of their capital or by mergers.[2]

The Textile Industries

The postwar period has brought no decline in production in the silk industry, the leading industry of Japan. In fact, the output of raw silk in 1927 was 70 per cent greater than the output for 1918. It has been, however, a difficult period for the silk filatures and for the silk merchants, since the increase in output in several years has constituted overproduction and has severely depressed prices. The government has been called upon again and again to assist the industry with funds either for pegging the price of raw silk or for making loans on silk withheld from the market in the hope of raising the price. In September, 1920, upon the urgent petition of the sericulturists, the government established the Imperial Sericultural and Silk Yarn Company, with a capital of $7,500,000 and the assurance of additional government support to the amount of $25,000,000, for the maintenance of the price of raw silk through purchases on the market at a fixed level. The filatures, on their part, agreed to a reduction of 50 per cent in the output of raw silk and to the restriction of cocoon production until the market had become firm. The government corporation continued its purchases until June, 1921. Though it undoubtedly gave relief to the domestic wholesale silk merchants, the corporation was not considered as a success in the maintenance of prices, since the level fixed was too high and served to stimulate output and build up stocks. In the last five years, the government has had to pay out $15,000,000 in indemnifying banks for losses incurred in advances to the silk industry.

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[1] YAMASAKI and OGAWA, *op. cit.*, p. 226; *Iron Age*, Nov. 15, 1923, p. 1319.

[2] The background of output limitation by producers, price fixing, and government aid that is presented in this chapter has been taken from many sources, among them, the *Japan Weekly Chronicle*, Kobe, 1920 and 1921; *Trans-Pacific*, *op. cit.*, 1926 to 1930; Mitsubishi *Monthly Circular*, *op. cit.*, 1927 to 1929; Cotton Mills and Workers in Japan, *op. cit.*, 1919.

Under a plan adopted in November, 1928, and put into effect on January 1, 1929, the Japan Central Silk Association is collecting from the exporters a compulsory deposit of $12.50 per 1,000 kin (1,334 pounds) of export silk for the building up of a fund of $15,000,000 to be used for the regulation of prices.

On January 1, 1928, the membership of the Central Silk Association also agreed that all filatures should either postpone the beginning of reeling operations by one month or seal 20 per cent of their basins during the six months from January 1 through May 31, 1928. In February 1930, the reelers again instituted a 20 per cent non-utilization of basins for at least four months, and in the early part of the year it was reported that many filatures were unable to pay their workers. By the summer of 1930, the silk reeling industry was reported to be in a very serious condition due to overproduction and falling prices. There were failures of many filatures, and in several districts, the filatures decided to suspend operations indefinitely. A government loan of 40,000,000 yen ($20,000,000) was provided to assist the industry, and it was decided to reduce the working day in all filatures from eleven hours to ten. The Ministry of Agriculture and Forestry addressed a letter to the prefectural governors asking them to urge the sericulturists to limit their production of summer and autumn cocoons.

Due to unsatisfactory market conditions, the weavers of habutae silk in many districts of Japan were forced to close their factories for periods of a month or more in 1920 and beginning March, 1930, the manufacturers of habutae in Fukui Prefecture agreed to the non-utilization of one-third of their looms and the suspension of business for eight days and nights per month. The weavers of pongee restricted their output by 20 per cent in 1927, and the silk cloth weavers suspended work for 8 days in November, 1928. As a result of the collapse of business following the bank failures of 1927, the famous Nishijin silk weaving center of Kyoto and the nearby dye center were forced to stop operations for a time.

The cotton spinning industry, though it has been the most successful factory industry of Japan, has had a very irregular history. It has passed through several cycles of unusual prosperity, expansion, overexpansion, overproduction, depression, and curtailment. Its growth did not begin until about 1885, but by 1890, due to a combination of circumstances including an increased rate of exchange, a tight money market, a flood, bad crops, and the competition of the newly established spinning mills in Shanghai, it was necessary to close the mills for 8 days and nights per month during the period from June 15 to September 14. In 1897 and 1898, following the China-Japanese War, restrictions of 4 days and nights per month were imposed. After the Boxer trouble in 1900, night work was suspended for a time. Between May, 1908, and May 1912, output was curtailed by 27.5 per cent and between August, 1914, and December 1, 1914, the mills were closed 4 days and nights a month. During the World War, the industry was prosperous and expanded rapidly. There should have been, however, ample warning that the growth was exceeding the limits of safety, for despite the great demand for cotton yarn, the output between 1913 and 1918 increased by only 23 per cent though there was an increase of 44 per cent in spindle capacity. Following the Armistice, the demand for yarn in the domestic market and for export declined sharply and there was a drop in prices. In an attempt to support the market, the Cotton Spinners' Association arranged in May, 1920, for a reduction of 15 per cent in output, but it was soon evident that it was an inadequate restriction and in June it was increased to 30 per cent and in July to 40 per cent. The 40 per cent restriction was continued in effect until September, 1921, when it was reduced to 30 per cent. The policy of limiting output had aroused so much criticism that the Association finally agreed to abolish it completely on December 15, 1921. The Association held to the agreement until May, 1927, when its members decided to seal 15 per cent of their spindles. In November, 1927, the curtailment ratio was increased to 23 per cent. Exceptions were made for certain mills and the actual reduction was about 18 or 19 per cent of the total spindle capacity of the Association. The restriction continued in force until July 1, 1929, the date of the abolition of midnight work for women in the spinning industry. New machinery was soon installed to more than offset the curtailment of hours and in February, 1930, the Spinners' Association again instituted an agreement for output limitation. By May 1, 1930, 27 per cent of the Japanese spindle capacity was sealed.[1]

Since the war, the woolen industry has been in almost continuous difficulties. A reduction of 40 per cent in output was in effect in the *mousseline* industry in 1920. From December, 1927, to January, 1929, the number of looms in operation was limited to 75 per cent of the average number in operation during the 4 months from June to October, 1927. Three of the larger companies, the Toyo Muslin Company, the Godo Woolen Textiles Company, and the Tokyo Muslin Company, have suffered severe losses and in July, 1929, it was reported that they would declare no dividends.[2] Negotiations were begun to bring about a merger of the three companies and a reorganization of their finances, but before any effective measures could be taken two of the companies had failed.

The Iron and Steel Industry

The spectacular expansion of the iron and steel industry has been followed by a reaction almost as striking. The Japanese producers have had to meet the renewed competition of the European makers of iron and steel and also of the cheap Indian pig iron. Prices have declined nearly to the prewar level and costs of production have remained unchanged or have increased, for, since the war, there has been some rise in the level of wages. The war plants were built hastily and with too little attention to mechanical equipment for economical operation in a competitive market, The limitations of naval armaments, accomplished by the Washington Conference of 1921–1922, and the consequent curtailment of the government shipbuilding program was another blow to the industry.

Five of the large iron works agreed to reduce their outputs substantially in 1921, and the Osaka Iron Works, which employed 9,000 workers during the war, had only 1,300 workers in 1926. An agreement was entered into in 1927 by the private steel producers and the Imperial Steel Works which limits the output and restricts each mill to certain products. But the depression in the iron and steel industry has not shown itself especially in any decline in production. The output of pig iron, after the first sharp drop in 1920 and 1921, has gradually recovered and in 1925 the high level of the war years was again reached. The steel output has continued to increase steadily with only a slight decline in 1920. The output, however, has not kept pace with demand, for the Japanese plants supplied 63 per cent of the consumption of pig iron and 47 per cent of the consumption of steel plates in 1919 and only 53 and 36 per cent, respectively, in 1924.[1] In 1928, 60.5 per cent of the supply of pig iron was produced in the furnaces of Japan Proper (see Table X).

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[1] *Trans.-Pacific, op. cit.*, June 19, 1930.

[2] *Trans-Pacific, op. cit.*, July 11, 1929.

Without the very active assistance of the government, the Japanese iron and steel industry could not have continued its increase in production. The private enterprises have declined somewhat in relative importance and the Imperial Steel Works has recovered in part its prewar position as the dominating factor in the industry. It produced 66 per cent of the pig iron output of the country in 1926 in comparison with 46 per cent in 1918. If to the 1926 output of the Imperial Steel Works is added the output of the blast furnaces of the Toyo Iron Manufacturing Company, operated since 1921 by the government plant, the total is 79 per cent of the pig iron production of Japan, or more than the government contribution of 74 per cent in 1913.[2] The recovery of the government participation in steel production has not been as marked. The Imperial Steel Works produced 57 per cent of the Japanese output of steel products in 1918, 50 per cent in 1919, 57 per cent in 1926, and 58 per cent in 1927.[3]

The government has also extended assistance to the privately owned steel plants. After an investigation by a government commission, an Imperial Ordinance was promulgated in April, 1927, continuing the tax exemption provisions of the law of 1917, raising the import tariff on iron and steel manufactures by 3 per cent, and also granting the following subsidies to plants meeting certain requirements as to capacity:[4]

1. On the manufacture of steel:
    - *a.* On steel manufactured under the hot process, a subsidy not exceeding 6 yen ($3) per metric ton of pig iron consumed.
    - *b.* On steel manufactured under other processes, 3 to 5 yen per metric ton of pig iron consumed.
2. On such steel manufactures as ingots, billets, bars, rods, plates, armor plates, tubes and pipes manufactured in Japan and used for shipbuilding or ship repair:
    - *a.* Steel ingots and billets, 15 per cent of the value.
    - *b.* Bars and rods, 18.3 yen per metric ton.
    - *c.* Plates and armor plates 18.33 to 23.33 yen per metric ton.
    - *d.* Tubes and pipes, 15 to 18 per cent of the value.

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[1] The Production of Iron and Steel in Japan, *op. cit.*, p. 4.

[2] *Op. cit.*

[3] *Op. cit.*, p. 31.

[4] *Trans-Pacific*, *op. cit.*, May 14, 1927, p. 19.

Despite the government assistance, the Japanese iron and steel companies have had a precarious existence in the postwar years. If they have continued in operation, it has been with slight profits or even at a loss. Their unusual profits of the war years were distributed in huge dividends or expended in the fever of expansion, and no surplus was accumulated for a depression. By the end of 1923, 16 of the iron companies and 16 of the steel companies had been forced to close. One iron producing company and one steel plant have transferred their furnaces and mills to the Imperial Steel Works for operation. Three important companies, the Japan Steel Tube Company, the Japan Steel Works, and the Kobe Steel Works, have written off approximately one-half of their capital. Dividends have been greatly reduced or have disappeared. In 1925, eight important steel companies made an average of only 2.5 per cent on their paid up capital and in 1926, private steel companies with a total capital of $115,000,000 showed profits of only $4,500,000.[1] The Kawasaki Dockyard Company had a profit of 5 per cent, but in 1927 the finances of the company were so demoralized that the Navy Department took over the plant for operation.

At the present writing, the Japanese iron and steel industry is experiencing the effects of overproduction. The Imperial Steel Works has announced a cut of 50 per cent in the production of thick plates and of from 10 to 30 per cent in the production of rails of different sizes beginning July 1, 1930, and the private steel manufacturing companies have announced a cut of 50 per cent in the production of base-grade round bars.[2]

In the last 15 years, practically every other Japanese factory industry has passed through cycles similar to those already described for the major industries. To meet the war demand, manufacturing facilities were quickly increased, but with the Armistice the war expansion soon proved to be overexpansion. There was overproduction, a decline of prices, and an industrial slump. Losses and failures followed. In an effort to bolster prices and to strengthen the industries, there have been restrictions on output almost continuously since 1927 in the manufacture of flour, fertilizers, cement, bleaching powder, matches, dyes, bricks, and glass, in the refining of sugar, in the weaving of hemp fabrics, in silk spinning, in the making of paper, and in coal mining. Rayon has added to the list in December, 1929 and cotton cloth in 1930. There have been attempts to fix the price of rice, flour, rubber, rayon, camphor, beer, salt, and many other commodities.

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[1] The Production of Iron and Steel in Japan, *op. cit.*, p. 4.

[2] *Trans-Pacific, op. cit.*, June 26, 1930.

Even at the present time, 1930, the difficult period of readjustment has not been closed. The overexpansion of the World War has not been absorbed and Japanese manufacturing has not been restored to a stable foundation. There are few industries that are operating without some restrictions on prices or output.

A SUMMARY OF JAPANESE INDUSTRIAL DEVELOPMENT

It seems evident from the preceding survey that Japan is not a strong industrial nation though industrialization has been in progress for 75 years and has had the active encouragement of the government. There has been a considerable development of manufacturing, but agriculture continues to be the dominant occupation of the country. Relatively few workers are engaged in the factory industries, and the industrial units are generally small. The great dependence of the country, both in industry and in trade, continues to be raw silk. Much of the remarkable progress of the last few years was accomplished through the very abnormal conditions of the war period and, for the time being at least, seems to have resulted in a weakening rather than a strengthening of the Japanese industries. In the following chapters, an analysis of the possibilities of Japan for further industrial development will be presented.

CHAPTER XIV

CAPITAL AND MECHANICAL SKILL

THE limitations of the Japanese industrial system and the unsatisfactory rate of its growth, if admitted, are usually accounted for by the short span of years during which the country has been in contact with the West and has had industrial ambitions. Time is undoubtedly an important factor in explaining present conditions, but industrialization has now been in progress for 75 years, not a brief period in modern industry if the phenomenal growth that has occurred in the United States since the Civil War or in Germany since 1871 is considered. The weakness of Japanese industry is more than immaturity. It lies deeper and is more fundamental. It is the result of the poverty of the country and of other factors that cannot be altered easily or quickly. They are factors so vital that they seem certain to put their permanent mark on Japanese industry. Though there undoubtedly will be further development, Japan cannot hope to become a manufacturing nation of major rank. Her successful industries will necessarily be restricted to a limited number.

A country's strength or weakness in industry, realized or potential, depends in the final analysis upon its strength or weakness in capital, mechanical skill, raw materials, power, labor, and markets. In none of these basic elements is the position of Japan entirely satisfactory. Much of the present industrial development has been accomplished through the offsetting of natural handicaps by the vigorous enterprise of a paternalistic government in the liberal use of subsidies and through the fortuitous circumstance of a great war, but an industrial structure must have a firmer foundation if it is to prosper and continue to grow.

The scarcity of capital and the deficiencies in mechanical skill, though they have been very significant in the past in restricting industrial growth, are probably the least vital of the factors listed above, for they are not necessarily permanent. With success in industry and commerce, capital is accumulated, and skill is developed through experience. Though apparently quite distinct factors, they are related, for both are essential if plant equipment is to be of the latest design and maintained in efficient operation. They will be discussed in the present chapter.

THE SCARCITY OF CAPITAL

In an earlier chapter, the scarcity of capital and its effect upon the introduction of western industries into Japan have been explained. The scarcity still persists though perhaps not to the same degree as in the last quarter of the nineteenth century. Through commerce and finance, large fortunes have been accumulated by such family groups as the Mitsuis, the Mitsubishis, the Sumitomos, the Yasudas. They began as merchants in the Tokugawa period or even earlier, the Sumitomos dating from 1591 and the Mitsuis from 1673.[1] They later added to their trading activities the exchanging and loaning of money and other banking functions. Their greatest growth has come since the opening of the modern period. They occupy a powerful position in the present day banking system of Japan and they have expanded into transportation, mining, and manufacturing. There are few important enterprises in Japan in which at least one of these groups is not interested. They have been responsible for the establishment of many of the new industries.

The High Interest Rate

Capital is still scarce in Japan, and to obtain it industry must pay high interest rates. In recent years, the rate throughout the country on overdrafts and on the discount of bills has averaged 10 to 11 per cent and has been as high as 12 per cent.[2] Such interest rates would seem to invite the flow of capital into Japan, for capital is fluid and can move across national boundaries, but it moves slowly and cautiously into markets that are new and strange. Despite modern inventions in communication, Japan and the money centers of the world remain widely separated in distance and in understanding. Many public and private loans have been floated in foreign countries by the Japanese, beginning with the government loan placed in London in 1870 for the construction of the Tokyo-Yokohama railroad, but except on the very best security the interest rate must be high. On January 21, 1930, for example, 6 per cent bonds, due in 1953, of the Tokyo Electric Light Company, said to be the largest and oldest electrical company in the Orient, were quoted on the New York market at only 89. Similar American securities were selling above par. On the same day, 4 per cent bonds of the Japanese government, maturing in 1931, were quoted at 95½, and United States Treasury fours, maturing in 1944–1954, at a little above 106.[3] When a new foreign loan of $125,000,000 was arranged by Japan in May, 1930, for the refunding of the loan due in 1931, it was necessary to price the bonds at 90 to yield 6.2 per cent.[1]

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[1] For a more detailed account of the origin and the present activities of these financial families see U. S. Bureau of Foreign and Domestic Commerce, Trade Information Bulletin, 653. The Big Five in Japanese Banking.

[2] Financial and Economic Annual, *op. cit.*, p. 180, 1928.

[3] *New York Times*, Jan. 22, 1930.

The scarcity of capital within the country is further aggravated by the conservatism of the people, who still hold to the soil and prefer to invest their savings in land rather than in industry though the rate of return would be higher. It has been estimated that in 1923 an investment would have yielded a return of 6 per cent, if it had been made in farm land, and 10.8 per cent if it had been made in the stock of the Kanegafuchi Spinning Company at the market price.[2]

The banking system is not organized to make the most effective use of the supply of capital available. It does not appear to be established on a sufficiently solid foundation to extend financial assistance to business when it is most needed. On March 15, 1927, the Watanabe Bank, a comparatively small institution with deposits of 37,000,000 yen ($18,500,000), failed. It precipitated a panic and brought the financial system tumbling down like a house of cards. To avert complete disaster, the government was forced to declare a moratorium, but before that step was taken 39 banks had closed, including the Fifteenth or Peers Bank with deposits of 368,000,000 yen.[3]

Many companies, probably because of the high interest rate, operate on so close a margin that in the event of any money stringency they are immediately in financial difficulties. In the banking crisis of 1927, many apparently strong concerns failed, including the Kawasaki Dockyard Company.

The money market is poorly organized, especially for the small industrialist. It sometimes happens that ample funds are easily obtainable by the large borrower at low interest, but that the small business man must pay exorbitant rates.[4] The Ministry of Finance announced in 1928 that it had decided to advance almost 15,000,000 yen ($7,500,000) to the governments of five prefectures for the relief of the small business man and industrialist.[5] The Toyko Business Man's Association recommended in 1929 that a plebeian bank should be established by the government for the financial relief of the middle and minor business man. Under the plan proposed, the bank was to be capitalized at 100,000,000 yen, and the funds, raised by the sale of 5.5 per cent government bonds, were to be loaned to it by the government at 6 per cent. The bank was to advance the money to the small borrower to be repaid in 10 years at an annual interest rate of 15 per cent.[6] The high interest rate proposed is good evidence of the present difficulties of the small industrialists. The situation is especially significant since so much of the Japanese manufacturing is carried on in small establishments.

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[1] *Op. cit.*, May 10, 1930.

[2] Dorothy J. Orchard, "Agrarian Problems of Modern Japan," *op. cit.*, p. 136.

[3] *Trans-Pacific*, *op. cit.*, Apr. 23, 1927; Apr. 30, 1927; May 26, 1928.

[4] *Op. cit.*, June 6, 1929.

[5] *Op. cit.*, Mar. 10, 1928.

[6] *Op. cit.*, June 6, 1929.

The Effects of the Scarcity of Capital on Industry

The scarcity of capital and the high interest rate that must be paid for it are responsible for a number of the characteristics of present day Japanese industry. The scarcity explains the activity of the government in establishing new industries, for private capital is seldom available for any large expansion or for a venture into a new field. It is the usual procedure for the government to establish the enterprise as an out-and-out government undertaking or to provide for its establishment by advancing the necessary funds to a private company. In an earlier chapter, the participation of the government in various industries has been discussed.

The scarcity of capital was offered by many Japanese business men as an explanation of the persistence of the small units in such industries as the manufacture of cloth in the Sano and Ashikaga districts and of the prevalence of household industries in every city and village of the country. It explains also the jobber, the wholesaler, and the various other entrepreneurs who send material for manufacture to the domestic workshops and thus keep alive in Japan an industrial system that dates back in England to the period previous to the Industrial Revolution. It is a difficult task for the more ambitious artisan to secure the funds necessary for the expansion of his workshop into a factory.

The Use of Old Equipment

Though industrialization in Japan is comparatively recent, much of the machinery in the mills is old and obsolete, in part a result of the scarcity of capital. If capital is difficult to secure, the management is very reluctant to discard machinery until it has long passed its period of maximum efficiency. In representative cotton spinning and weaving mills, visited in 1926, there were many looms and spinning frames bearing the dates 1894, 1897, 1899, 1901, etc. Much of the equipment in Japanese mills has been purchased second hand in England and the United States. In some instances, undoubtedly, the Japanese have been deceived and the western traders have followed the precedent set by the Dutch just before the opening of the country when they sold obsolete cannon to the Shogun and his followers. They have considered Japan as the proper market for the disposal of antiquated machinery. In most instances, however, the Japanese purchasers have insisted upon the old equipment because of false notions of economy and because the capital did not seem to be available for the purchase of new machinery.

Recently, a Japanese manufacturer of plain linoleum decided to undertake the production of printed goods. He dispatched a representative to the United States to purchase the necessary equipment. The representative was familiar with the modern linoleum printing machine, printing several colors at one time and turning out as much as 15,000 square yards in 9 hours, but he considered it too expensive a piece of equipment, especially since his labor was being paid only about 50 cents a day, and so he sought out in an American plant an old hand block printing outfit. It was not for sale. Its parts were lying about in a storeroom of the factory. Some of them were 40 years old, and the whole outfit had been discarded 15 years before. But the Japanese representative purchased it and had it shipped to Japan. In the immediate outlay of capital, he saved money, for he purchased the old equipment at a price much below the price of a printing machine or even below the price of a new hand outfit, but he installed in his plant equipment that could only have been disposed of as junk in the United States. He started in Japan a new industry in a stage of technical development that had become obsolete years before in the older industrial countries.

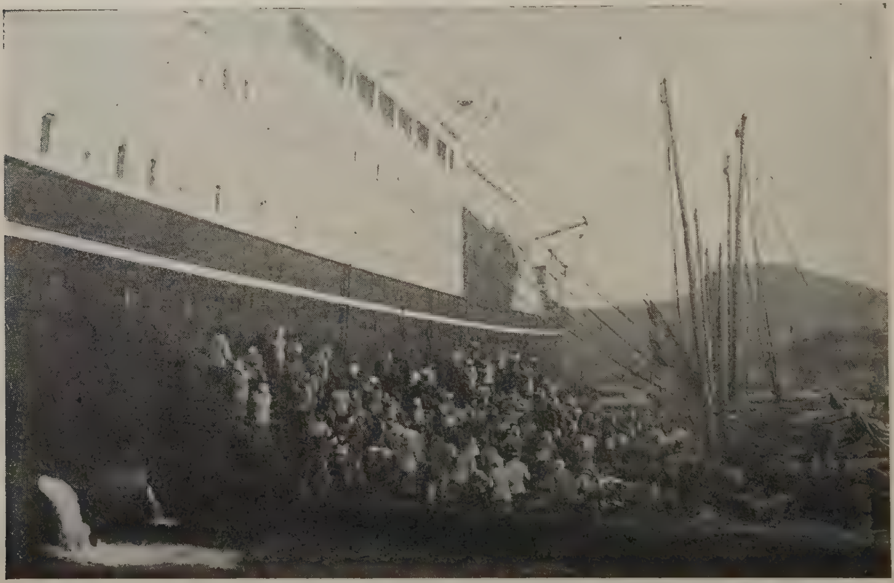

FIG. 89.—Steamers that stop at Nagasaki are coaled from barges with baskets passed from hand to hand in a human chain.

Since capital is scarce, the manufacturers attempt to get the maximum work out of their equipment. In the spinning industry, the machinery is operated at a somewhat higher speed than in American and European mills, and it is operated day and night. It is only within the last few months that midnight work has been abolished in the cotton mills in partial accordance with the Washington Hours Convention of 1919. In the face of the protest of other cotton manufacturing nations the Japanese have insisted that their industry did not possess the plant and equipment to permit a curtailment of working hours. Even with the recent reforms, the factories are operating with two shifts and the machinery is stopped only between the hours of 11 p.m. and 5 a.m., and in most of the factories the number of rest days per month has been reduced from four to two.[1]

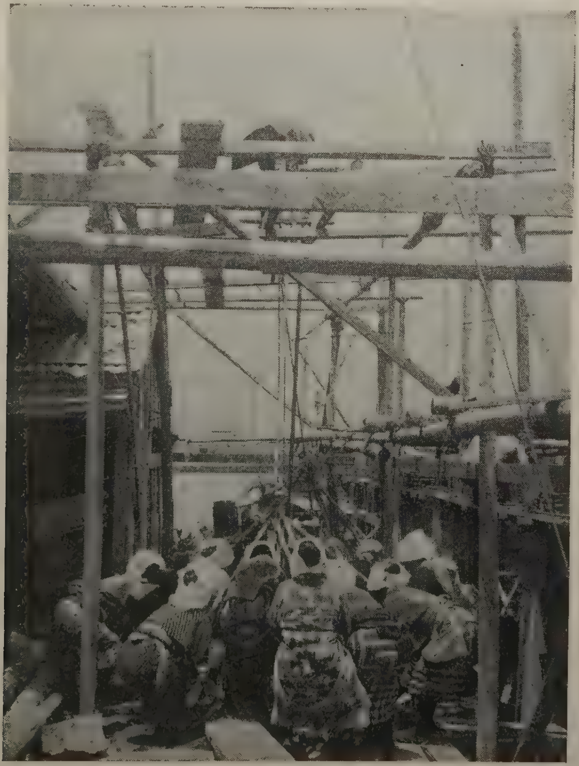

FIG. 90.—Driving piling by hand for a reënforced concrete factory building, Tokyo.

The effects of the scarcity of capital have been presented here, not because of their past significance, but because they seem likely to characterize Japanese industry for some time to come. Though the scarcity of capital may prove to be only a temporary condition, it will continue to be a serious handicap of Japanese industrial growth for the immediate future.

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[1] See Chapter XX.

THE ABSENCE OF A MECHANICAL BACKGROUND

It is not always easy to determine whether antiquated equipment is the result of poverty or of a low standard of mechanical ability that fails to detect inefficiency and to develop new devices. Though the Japanese have gained a reputation for cleverness in imitating, their advance in mechanical and technical proficiency has been slow. It is no reflection upon the Japanese as a people to state that they are not good mechanics. It is a shortcoming that is due to the absence of a mechanical background. During the centuries of isolation, the Japanese were skilled workers in wood. They were artists in the making of weapons and armor of iron and steel, but they knew nothing of the use of the metals in machinery. In three-quarters of a century, they have attempted to make an advance in mechanical knowledge that in England required several centuries. It is probably impossible for people of the West, accustomed through several generations to the use of

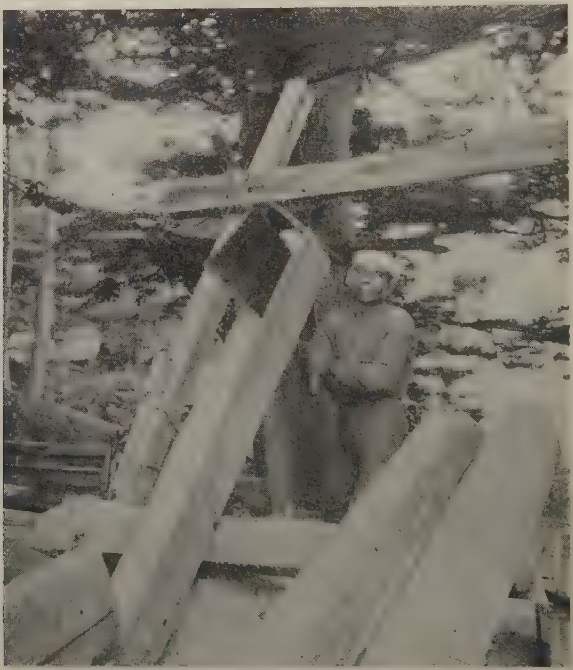

FIG. 91.—The primitive method of cutting planks still common in Japan. This photograph was taken in a wood yard on Lake Chuzenji in 1926. Compare Figures 25 and 92.

machinery, to appreciate fully the importance in their progress of the accumulated experience of previous generations, or to understand the mental readjustments that are demanded by the change from hand labor to the machine. The Japanese are starting out without experience, and they have not recognized the necessity of thorough engineering and mechanical training. Many technical schools have been established, but to the young man the white collar job is still considered to be the more desirable and to offer a more promising future. Many university professors, who were consulted, were of the opinion that their graduates went into the government service and into banks and not into factories. The Japanese government is coming to recognize the importance of technical skill and the weakness of Japanese industry in this respect. The Ministry of Education has let it be known that it desires an increasing number of boys and girls to go to technical schools and has instructed the prefectural governments not to encourage graduates from the elementary schools to go to middle and higher schools without regard for their special fitness for that type of education.[1]

The Dependence on Foreign Machinery

More rapid mechanical progress would perhaps have been made if the Japanese had been forced to master fundamentals, but there were ready at hand the fruits of the Industrial Revolution of the West. It was easy to borrow the mechanical technique and the machinery, and the Japanese industrial structure is borrowed—imported bodily from Europe and America, not always thoroughly understood and still not completely assimilated and adapted to Japanese needs and conditions. Even today, Japan has attained little importance in the manufacture of machinery, as is indicated in Table XIII. Between 1913 and 1925, there was a considerable advance in both her absolute and her relative position, but Japan still ranks far below the United States, Great Britain, and Germany, and even below Canada, Russia, France, Italy and Switzerland in the world output of machinery.

Japan exports very little industrial machinery, and most of the equipment in modern Japanese factories is of foreign origin or is copied from foreign models. Spindles and looms from England, wool washing and drying machinery from the United States, woolen cloth finishing machinery from Alsace, paper making machinery from Vienna, wire drawing machines from Connecticut, pottery machinery from Germany, Czechoslovakia and Austria, the equipment of a linen mill from France, England and Ireland, sewing machines in a clothing factory from the United States and Sweden and cloth cutters and pressers from New York, machinery for brush making from England, France,

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[1] *Trans-Pacific, op. cit.*, Mar. 6, 1930.

TABLE XIII.—WORLD OUTPUT OF MACHINERY[1]
(Value of total world production in million marks)

Country	1913		1925		
	Value at 1913 prices	Percentage of total value	Value at current prices	Value at 1913 prices	Percentage of total value
United States	6,775	50.0	12,697	8,465	57.6
Canada	320	2.4	710	473	3.2
Great Britain	1,602	11.8	3,010	2,007	13.6
Germany[2]	2,800	20.6	2,900	1,933	13.1
Russia	475	3.5	405	270	1.8
Austria-Hungary or Succession States	460	3.4	332	221	1.5
France	263	1.9	520	347	2.4
Italy	175	1.3	260	173	1.2
Belgium	154	1.1	162	108	0.7
Switzerland	150	1.1	285	190	1.3
Sweden	122	0.9	170	113	0.8
Other European countries	136	1.1	241	161	1.1
Australia and New Zealand	76	0.6	152	101	0.7
Japan	47	0.3	215	143	1.0
Total	13,555	100.0	22,059	14,705	100.0

[1] League of Nations, International Economic Conference, Geneva, May, 1927, Documentation, Mechanical Engineering, Vol. I, p. 30.

[2] In comparing postwar and prewar Germany, cessions of territory must be taken into account.

and Germany, electrical equipment from the United States, mining machinery from the United States and England, heavy dock equipment for loading coal from England, a furnace in a zinc smelter from Germany and zinc rolling mills from Pittsburgh, machine-shop equipment in a locomotive works from the United States and England, brewing apparatus from Germany, match making machinery from Germany and Sweden, and the equipment of an iron and steel plant from Germany are some of the examples of imported industrialization noted during visits to Japanese factories in 1926.

It is perhaps a commentary on the paralyzing influence of a ready-made mechanical system that the Japanese have made much more spectacular scientific contributions in fields that are peculiarly their own than they have in fields borrowed from abroad. Japanese skill has perfected the culture pearl and has been very successful in the development of fish hatcheries. Many important improvements have been made in sericulture, especially in the rearing of cocoons and in the controlling of the diseases of the silkworm, but progress has undoubtedly been hampered by the ease with which new stock could be imported from China or Italy. Through cross-breeding, the length of the filament has been increased from about 600 to 1,000 feet per cocoon, but the imported stock is not well suited to the Japanese climate, and many varieties do not live beyond the second generation. Sericulturists are now intent upon improving the native strains and thus producing a cocoon that will have good reeling qualities and a silkworm that will be stronger and more adapted to the climate. In the making of lacquer ware, the Japanese were able to go far beyond their Chinese teachers, but the industry has remained a hand industry. There is a large factory in Kyoto, but it has no machinery. The same situation prevails in other ancient Japanese industries, such as the making of cloisonné and damascene. A high artistic standard has been reached, but there is not even the beginning of an industrial revolution.

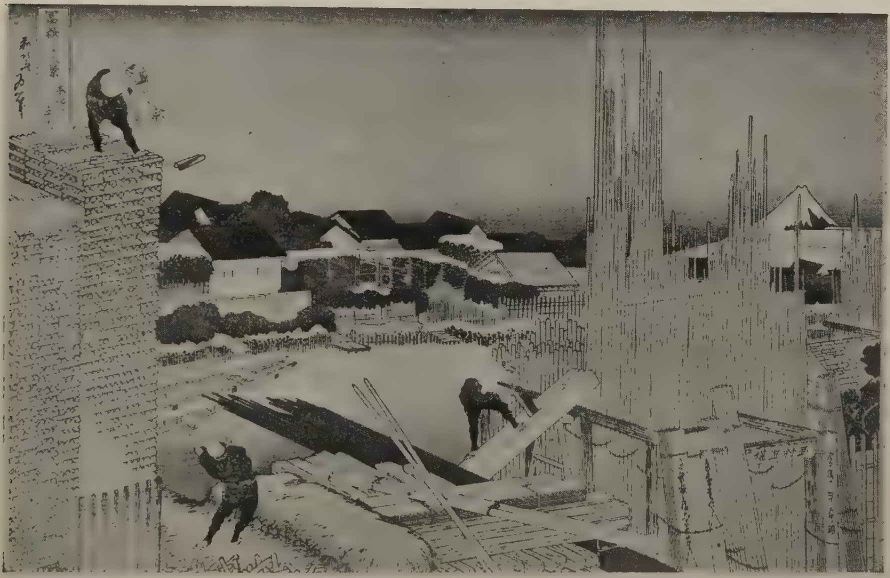

FIG. 92.—There has been little change in the last century in the preparation of timber. Even the saws remain the same. (*From an early nineteenth century print by Hokusai in the collection of the Metropolitan Museum of Art.*) Compare Figure 91.

The imported machinery is not always well suited to Japanese requirements. In a linen factory in a suburb of Tokyo, machines from Belfast are being used. They are designed for the Irish lassies, however, and the smaller Japanese girls must stand on benches to operate them.

Japanese Industrial Inventions

During the early years of the nineteenth century, many machines were imported into the United States from Europe. But the industrial development of New England did not depend for long upon old England. The Yankees had a mechanical background, and under the pressure of the scarcity of factory labor, the imported machines were improved rapidly and new inventions were made that found their way back across the Atlantic to Europe. There has been no such development in Japan. In over 100 establishments visited, I failed to find a single important mechanical appliance of Japanese invention. There were Japanese machines, and the use of machinery of Japanese manufacture is increasing, especially in the cotton mills and in the copper refineries, but upon close questioning I always discovered that the Japanese machine was a copy of a machine originating in the United States, England, Germany, or some other western country. In a textile mill in Tokyo, there was a yarn sizing machine from Roubaix, France, and on either side was its apparent counterpart bearing the plate of an Osaka manufacturer. Much of the machinery in the tea factories of Shizuoka is modeled after machinery in use in India. The cloth cutting machinery in a factory making Japanese socks was copied from a German machine, some of the machinery in the Seto potteries was Japanese but it was similar to the foreign models. A machine labeling boxes in a match factory was a copy of a German machine. Much of the machinery in the match industry is made in Japan, but it is modeled after foreign designs. The machines used in making hemp braid were copied from the Swiss. The kettles in a large dye factory were designed after kettles brought from America. In a gage and meter factory in Tokyo, a Bristol gage of American manufacture was being used as a model. Shears for cutting mulberry, that are direct copies of a German design, are being manufactured in the village of Sakai. Straw hats are an imitation of the Swiss, and the beads made in Osaka are an imitation of the French product.

The Toyoda company in Osaka is manufacturing an automatic loom that is reported by a British textile expert to be very efficient.[1] Its widespread adoption in Japanese mills will undoubtedly bring about a revolution in the industry and lower the costs of weaving cloth. The Toyoda loom is patterned after and does not differ materially from an American type of automatic loom. As yet there has been no demand for it abroad except in the Japanese mills in China. Recently, arrangements were made by Platt Brothers, of Oldham, England, to manufacture the Toyoda loom for sale in all countries with the exception of Japan, China, and the United States.

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[1] ARNO S. PEARSE, General Secretary of the International Federation of Master Cotton Spinners, "Japan's Cotton Industry," *Trans-Pacific, op. cit.*, p. 5, July 18, 1929.

Most of the copied machinery is less efficient than the models from which it has been made. A large manufacturer of electrical equipment in Tokyo, according to one of the Japanese engineers, uses little Japanese machinery because it is not as accurate as the imported and it is feared that the quality of the product may be affected. In many instances, progress has stopped with the importation or copying of the foreign equipment. Its possession does not seem to have stimulated the Japanese to invention or improvement. The low wages paid to labor have furnished no incentive to the development of labor-saving devices and have even discouraged their introduction. Machinery is often used long after it has been superseded in foreign countries by later designs, partly because its shortcomings are not realized and partly because the capital is not available to purchase the new. If, finally, it must be replaced, it is usual to import the new equipment from abroad. Thus, the industrial system of Japan has depended both for its inception and for its development upon the industrial progress of the West. As long as Japan is content to continue the policy of borrowing and copying, it seems inevitable that she must lag behind the western countries in industrialization.

The first modern machines for the reeling of raw silk were brought from France in 1873. Though the industry is the leading one of the country, and all important economically, it has undergone few mechanical changes in the last 50 years. Except that the reeling machines now have power and a greater number of reels, they are essentially the same as those originally introduced by Breuner.

Four or five Japanese technical experts are sent to Italy or France every year to study the silk industry, but Japan has failed to keep pace with her teachers. In the filature established by the French experts at Tomioka, the number of reels per basin has been increased from two to three and then to four. Seven or eight years ago steam power was replaced by hydroelectric. In the meantime, in France and Italy a machine with 8 to 12 reels per basin is in common use and the reels are large enough to eliminate the rereeling which is still the usual practice in Japan. A few of these modern European reeling machines, or machines designed from Italian models, have been introduced into Japan, but most of the Japanese silk is reeled on the old type of machine with four to six small reels per basin. In only one or two factories have the new machines proved successful in operation. In 1924, 50 basins of the new type were installed in the Tomioka filature. Each basin has 18 reels of the large size. The machine was spoken of as a

Japanese invention, but it is almost identical with, though somewhat less efficient than, the type in common use in Italy.

In the largest rubber factory in the Kobe district controlled by Japanese, cloth is rubberized by pouring upon it from hand dippers the liquid rubber mixture and then passing it between rollers. Three men are required to operate the machine. In the same factory, the tread is put on the bicycle and rikisha tires by wrapping the pattern tightly to the tire by means of a wire. It is a device used commonly in rubber factories two or three decades ago but now discarded. In a neighboring factory, employing 100 workers and with a daily output valued at $750, rubber heels are cut from the sheet, one at a time, by means of a steel dye and a wooden mallet wielded by a workman, and the trade mark is put on the soles of the shoes in a hand screw press. The uppers for the rubber shoes are cut out with scissors by hand. It is fair to state that the Japanese have made no significant contributions to the rubber industry. Their processes were borrowed from the British Dunlop factory established in Kobe in 1897 and they have failed to keep pace either with the improvements introduced into that factory or with the developments in the industry in other countries. The Japanese rubber factories are small and lack the capital to purchase the new equipment.

In a bolt and nut factory in Tokyo, employing 32 men and producing for government order, each individual bolt is fastened into the machine for threading and is then put into the fire by hand and forged partly by hand and partly by machine hammer. In many of the pottery establishments at Seto, a crude mortar and pestle arrangement is still in use for crushing the clay. Glass factories in Tokyo are blowing cheap bottles in molds and in only one or two large factories in Osaka are bottle making machines in use.

A recent government commission, appointed to investigate the iron and steel industry, stated in its report that poor technical methods were a major cause of the unsatisfactory position of the industry.[1]

THE ORGANIZATION OF JAPANESE FACTORIES

Administrative ability in the organization of a factory and technical skill in developing machinery are quite distinct qualities, but they are usually found together. A large amount of capital invested in equipment acts as an incentive to effective utilization. Japanese factories are for the most part poorly organized, and little attention has been given to the latest developments in factory management. In the domestic workshops, there is no attempt at scientific management and, in view of the small size of the unit, such a development seems scarcely necessary. The larger factories are not planned for the efficient handling of materials, and a great deal of labor is wasted, undoubtedly because labor is considered to be cheap. In the Tokyo bolt factory, mentioned above, the pieces of steel rod from which the bolts are made are allowed to drop to the floor from the cutting machine and are picked up and arranged by hand in preparation for the next operation. In the government clothing factory in Oi, a suburb of Tokyo, where uniforms for the railway workers are made, the latest type of cutting, sewing, and pressing machinery is used, but on the woolen garments there is little division of labor. One man completes the garment from basting to pressing. The buttons are sewed on and the buttonholes are worked by women workers.

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[1] *Trans-Pacific, op. cit.*, May 14, 1927.

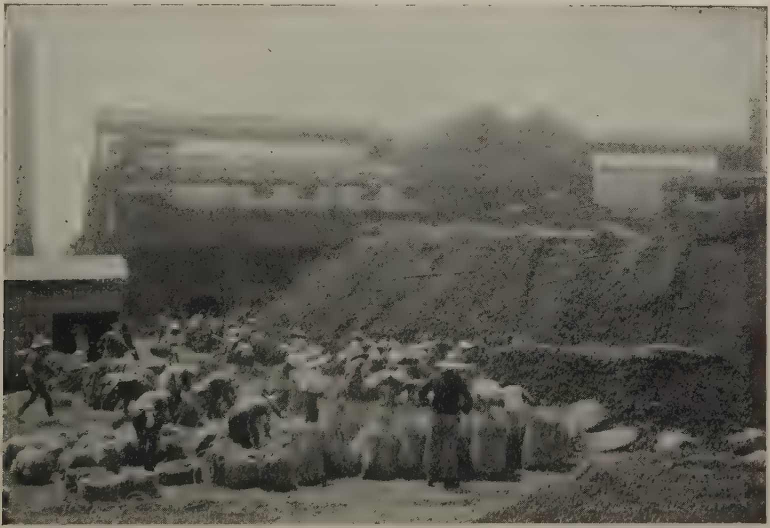

FIG. 93.—Loading coke into straw bags by hand at the plant of the Tokyo Gas Company.

In potteries and in match factories, women were seen working with babies strapped to their backs, and other children were playing about in the workroom. The efficiency of the women undoubtedly would be increased if the management would provide a nursery for the care of the children.

Finished pottery is still transported the 10 miles from Seto to the Nagoya market centers by man-drawn hand trucks. At one of the largest copper smelters in Japan, clay for the lining of the furnaces is carried down from a nearby hillside on the backs of women. At the plant of the Tokyo Gas Company, coke is put into bags by hand and then carried by coolies, some of them women, to the barges in the adjacent canal. Coal, even in the larger Tokyo plants, is unloaded by hand and carried in baskets to the power houses. In the smaller plants, the unloading of the coal is a task that the workers are supposed to perform in addition to their regular duties. At the present time, there is much agitation over this system, and recently several strikes against it have been declared in Tokyo.[1]

A very striking example of poor organization and of the inefficient handling of material is to be found in the Imperial Steel Works at Yawata. The plant has all been built since 1900 and the equipment is modern, but the different units are not arranged properly with reference to each other and to transportation facilities. All of the iron ore and a part of the coal are brought in by water and are stored along the shore on built up land. The coal washing plant, the coke ovens, and the blast furnaces are located on the opposite edge of the plot of land belonging to the works, as far as possible away from the water and the storage facilities. The intermediate area is occupied by the steel mills and the rolling mills. The raw materials must be transported by overhead cableways across the yard to the coke ovens and blast furnaces. They then work back toward the water through the different manufacturing processes though the finished products are sent to market largely by rail.[2]

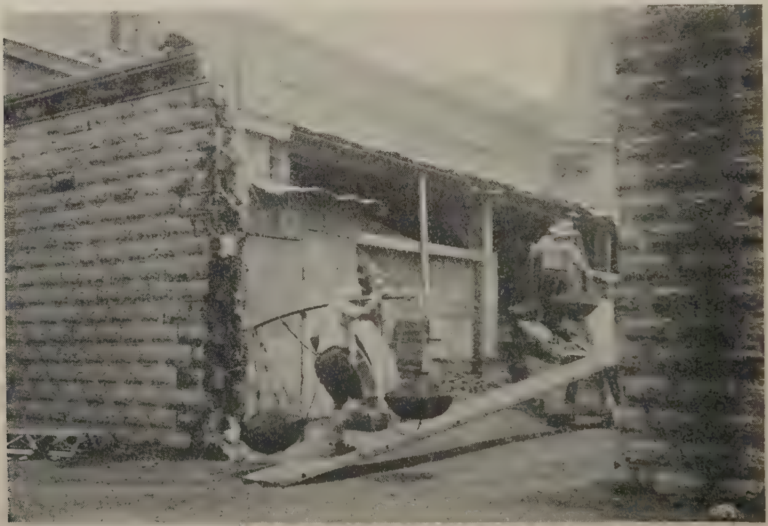

FIG. 94.—Carrying coal from a barge to the power house of a large Tokyo cement plant.

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[1] *Trans-Pacific*, *op. cit.*, Jan. 27, 1929.

[2] Production of Iron and Steel in Japan, *op. cit.*, p. 11; also map accompanying Summary of the Yawata Iron Foundry (in Japanese), *op. cit.*

The Inefficiency of the Silk Industry

The organization of the silk filatures is especially inefficient. In some establishments, the reelers must stop their machines and leave their basins to get fresh supplies of cocoons. Gravity funnels or moving belts are rarely used for the distribution of materials. In Kofu, one company stores all of its cocoons in one filature and then distributes the necessary quantity each day by hand-cart to its other filatures. The customary closing down of the filatures in most of the prefectures for two or three months each year because of cold and the shortage of cocoons is an evidence of the weakness of the management. Warmer filatures could be built or the existing ones heated, and there is no technical difficulty to prevent the storing of cocoons for operation throughout the year. In Aichi Prefecture, the filatures do not find it necessary to close. In the past, the government has classified silk reeling as a seasonal industry and has permitted the addition of an hour to the daily hours of labor of the workers during the summer season. The Bureau of Social Affairs has decided recently, however, that it is possible to operate the filatures without any interruption and, accordingly, in January, 1927, silk reeling was removed from the list of seasonal industries.[1] This change in the status of the industry will undoubtedly lead to a more efficient organization for operation continuously throughout the year.

In general, the Japanese silk manufacturer has not given much thought to improved machines, to technique, or to factory management. He has contributed little to production other than the provision of a building and of simple equipment. He has developed the industry largely on the basis of cheap labor and insists that its future depends upon the continuation of cheap labor. With the development of a raw silk industry in China and the perfection of artificial silk, a more rapid improvement in mechanical equipment and in plant administration may be expected, for the keener competition in world markets will force the lowering of the costs of production.

In few Japanese plants has there been any attempt to install the efficiency methods that have characterized the development of American industry in the last decade. The neglect of organization is due partly to the training of the management, partly to the conservatism of the workers and their reluctance to alter methods that have been handed down through many generations, and partly to the belief, current in the Orient, that since wages are low, labor need not be used efficiently. There is one notable exception to this general condition in a large factory manufacturing a typically Japanese product. It has an industrial engineer trained in America. He has installed all of the efficiency devices of routing, task and bonus payments, and division of labor of the Taylor and derived systems. Production has been increased remarkably, and the company is prospering, but the officials are puzzled by the reluctance of the workers to remain any length of time. The factory building is an especially fine one, light and airy and well ventilated, the dormitories are excellent, a school for the girls is provided, and there is a recreation ground with a tennis court. Yet the turnover is high and the average length of a girl's stay is one year and seven months. The industrial engineer gave as the reason for the shifting of the labor the age and unsteadiness of the young girls. The management apparently has failed to realize that there is a limit to the endurance of the girls and that they cannot be speeded up beyond that limit. Efficiency has been carried too far. The strain is noticeable as one walks through the factory. The girls sit on the edge of their chairs and their bodies keep up a nervous rhythm as they operate their machines and strive to equal or exceed the task that has been assigned them. With all their speeding, however, wages are not high. There are some 3,400 girls employed, and the average wage is $15 a month with a very few making as high as $50. The rate is about the same as in other Japanese factories where the girls work at a more

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[1] *Industrial and Labour Information, op. cit.*, Vol. 20, No. 6, Nov. 8, 1926.

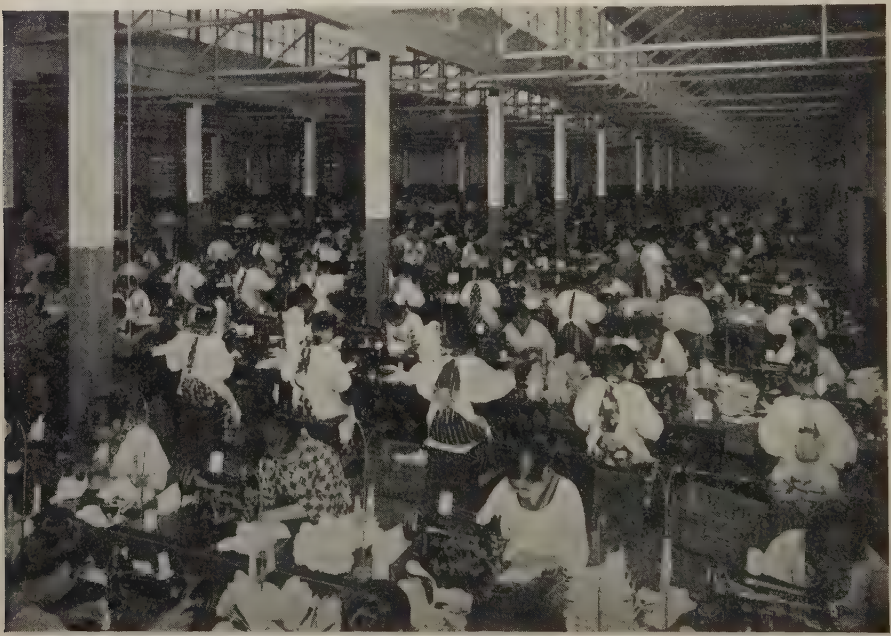

FIG. 95.—The one modern factory making Japanese tabi, or socks. Mass production and division of labor are eliminating the hand made product. (*Courtesy of Fukusuke Tabi Co., Ltd.*)

leisurely pace. It is another example of a system borrowed from abroad, but not adjusted to Japanese conditions. Costs of production have been lowered, but very little of the savings has been passed on by the management to the workers though their effort has been increased.

The shortage of capital and deficiencies in mechanical skill need not be permanent handicaps in Japanese industrialization. Both are indications of industrial immaturity. In time, capital will be accumulated, equipment will be improved, technical training will be advanced, Japanese labor will acquire mechanical experience, and the management will learn the importance of efficiency and organization. Already there is a great deal of interest in Japan in the so-called rationalization of industry. As the Japanese use the term, it involves the combination, both vertical and horizontal, of manufacturing industries, and it also involves reorganization within the factories to increase efficiency and to reduce the costs of production. Several industries have announced comprehensive rationalization plans, but as yet there have been very few tangible accomplishments in the new program.

In the following chapters, the other fundamental factors in industrial development—raw materials and power, markets, and labor, usually considered the principal asset of the Orient—will be discussed.

CHAPTER XV

RAW MATERIALS AND WATER POWER

A POVERTY of raw materials and of power is the most fundamental weakness of industrial Japan. It is directing the trend of manufacturing development and it will set the final limits to industrial expansion. Unlike other handicaps of Japanese industry, it promises to be permanent and to become even more serious as industrialization progresses, since a nation's endowment in natural resources cannot be increased easily. The scarcity of raw materials is the key to Japanese foreign policy, especially in China, for the securing of effective control of adequate supplies of the more essential resources has been the purpose of each aggressive move in that country and the aim of each succeeding administration during the past quarter of a century.

Through intensive agriculture, practically all of the nation's demands for food are met, and at present there is no great problem of food importation. The land cannot be made to produce much more, however, and if the population continues to increase, imports will be necessary. The solution of any food problem that may arise will depend upon the success of industrialization, for the manufactured products will be needed to send abroad in exchange for rice and wheat and fats.

RAW MATERIALS FOR THE TEXTILE INDUSTRIES

From agriculture also comes raw silk, one of the very few raw materials for industry originating in Japan. It might have been made the basis of an important silk weaving industry, but, instead, it has been the basis of the Japanese export trade and has gone to supply the looms of other countries. In recent years, about 82 per cent of the raw silk output has been exported in its raw state. The manufacture of silk cloth should become one of the leading industries of Japan. Silk weaving would never be hampered by any shortage of raw materials. If the industry does fail to develop, it will be because of other factors —the tariff restrictions in foreign markets perhaps, or the lack of initiative and ingenuity on the part of the Japanese weavers in creating a demand for their product abroad.

Raw Cotton

The textile industries, especially the cotton industries, are the major manufacturing industries of Japan. With the exception of the silk industry, all of them depend upon imported raw materials. Raw cotton is by far the most important import of the country, and in value it usually approximates the value of the raw silk exports. The climate of Japan is suitable for the cultivation of cotton, and during the years of seclusion cotton was produced in sufficient quantities to supply the domestic industries. With the opening of the country to trade, the land was turned to more profitable uses, especially to the production of food crops, and the cultivation of cotton has been abandoned almost completely (see Figure 5). The supply consumed by the Japanese spinning mills is secured from foreign countries, mainly from British India, the United States, and China. In normal years, British India leads as a source of supply, but in years of large production and low prices in the United States, American cotton may displace the Indian cotton. In 1925, for example, 56 per cent of the raw cotton imports of Japan were from British India and 35 per cent from the United States, but in 1927, following the huge American crop of 1926, 49 per cent came from the United States and 39 per cent from India.[1]

Japan is endeavoring to make her cotton industry more independent of foreign raw materials and is encouraging the cultivation of cotton in the lands under her control. There is little possibility that the production of cotton in Japan Proper can be increased. The arable area is limited and the demand upon the land for food becomes more insistent every year. In Korea, cotton has been cultivated from very early times, but prior to the period of Japanese influence the production was small and the quality was poor. There was no surplus for export. In 1906, an association for the encouraging of cotton growing in Korea was subsidized by the government.[2] American upland cotton was introduced, and its cultivation expanded rapidly from 3,000 acres in 1910 to 500,000 acres in 1927. Cotton now occupies about 4 per cent of the arable land of Korea. The total production was about 64,000,000 pounds in 1928, but only 10,000,000 pounds were available for export to Japan—an amount equal to less than 1 per cent of the total Japanese cotton imports. Despite the success that has been achieved, it does not seem probable that the cultivation of cotton in Korea can free Japan from dependence upon foreign sources of supply. Further expansion in Korea will be limited both by climate and topography and by the demands made upon the land for food by the dense population. Recently, two or three of the Japanese spinning companies have estab-

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1927.

[2] Bank of Chosen, Economic History of Chosen, p. 121.

lished branches in Korea, partly to be near a possible source of the raw material and partly to take advantage of the cheaper Korean labor.

The Japanese government is also encouraging the cultivation of cotton in the Kwantung Leased Territory and in the South Manchuria Railway zone. About 7,400 acres were cultivated in the Leased Territory in 1928 with a reported production of 4,000,000 pounds of cotton, but it is difficult to accept the figure since it would mean the phenomenal average yield of 540 pounds per acre.[1] For the period 1921 to 1925, Arizona, the American state with the highest average yield, produced only 278 pounds per acre. The Japanese government has announced that it intends to extend the cultivation of cotton in the Leased Territory and in the Railway Zone to almost 600,000 acres with an estimated annual production of 256,000,000 pounds.[2] It should be noted, however, that this is a rather optimistic estimate, for it is based upon the expectation of a per acre yield of over 425 pounds, a yield greater than the average for any cotton producing country, even Egypt, and more than three times the yield that is now being secured in Korea. Even with so generous an estimate, the total will be sufficient to replace less than one-fifth of the raw cotton now imported by Japan from foreign countries.

No other territory controlled by Japan has the climate or the area for the cultivation of cotton on any significant scale. The Japanese cotton mills must continue to depend upon imports for their raw materials, but the necessity of importing raw cotton cannot be considered a serious handicap for the industry. There are few cotton cloth manufacturing countries that are able to secure their raw materials from their own territory. Raw cotton is sufficiently valuable and compact to make the cost of transporting it a relatively unimportant item. New England, England, France, Germany, Czechoslovakia, and Italy all must bring their requirements of raw cotton from a distance, and the new mills in the Piedmont section of North and South Carolina are using cotton from Louisiana, Texas, Oklahoma, and even California. As in the case of silk weaving, raw materials will not be a factor in the development of the cotton industry. Though the raw cotton will be imported, the expansion of the industry will depend upon labor, improvements in machinery, and the organization of the industry, and upon markets.

Wool and Minor Fibers

With the shift to foreign styles in men's clothing, there has developed in Japan a demand for woolen cloth and a wool weaving

[1] *Japan Advertiser, Annual Review, op. cit.*, p. 45, 1929.
[2] *Op. cit.*

industry has been established to supply a part of that demand. Practically all of the raw wool must be imported, for Japan has less than 20,000 sheep.[1] The wool, however, can be imported readily from Australia. It is sufficiently valuable so that the freight charges do not add materially to its costs. It is probable that increasing supplies of raw wool will be available in Manchuria and Mongolia.

There is in Japan some weaving of cloth of ramie, flax, jute, and hemp, but the industries are of distinctly minor importance. About one-fifth of the jute and hemp fiber and somewhat more than one-half of the ramie and flax are produced in the country, flax being an important crop in Hokkaido. The remainder is imported mainly from the Asiatic continent and from Russia.

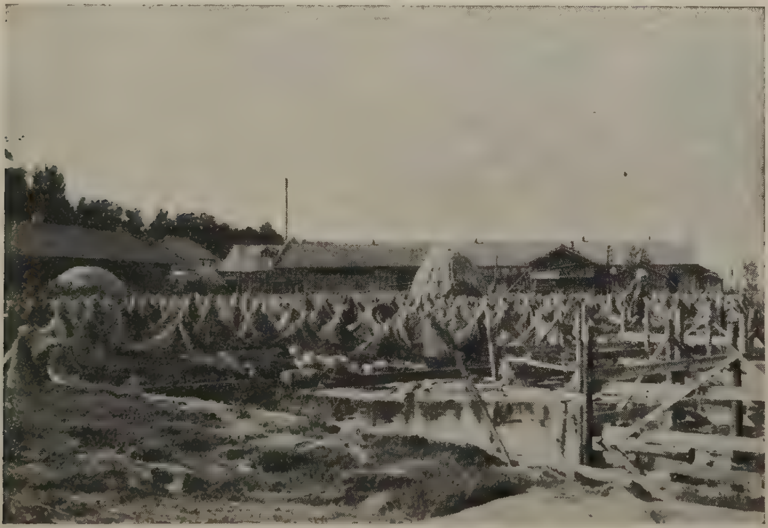

FIG. 96.—Retting flax in the yard of a fiber mill near Sapporo, Hokkaido.

It will be seen that with the exception of raw silk, the raw materials for the major textile industries are not produced in Japan. The industries are almost completely dependent upon foreign sources of supply, and there is little prospect of any greater degree of independence being achieved. The nature of the raw materials is such, however, that the expansion of the industries need not be hampered by any shortage of the domestic supply. The economic significance of the importation of the raw materials lies in the necessity of producing within the country commodities that can be sent out in payment for them.

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[1] Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928.

TIMBER RESOURCES

The timber industry has always been an especially important one in Japan. Until the beginning of the modern period, wood was the principal material basis of economic activity. It occupied a position comparable in its relative importance to the position of iron and steel in the industries of Europe and America. It was used not only in the construction of buildings, but it was the framework of most of the implements of agriculture and manufacturing. The mountainous parts of the islands were heavily wooded, but so great was the demand on the forests that Japan was threatened with the same deforestation that had denuded the hills of China. The danger was appreciated in time, and a wise and energetic forestation program has covered the slopes not suitable for cultivation with a good stand of timber. The industrial system of the West has introduced into the country cheap iron and steel and other construction materials to replace wood, but with industrialization new uses for timber are being discovered and the demands on the forests are becoming greater and not less. The islands of Hokkaido and Sakhalin are now important sources of supply and a large part of their area, because of topography and climate, should remain permanently in forests. Though Japan will probably always be a producer of timber and though present production may even be increased, there is no possibility that the forests on Japanese territory can supply the timber needs of the country. The population is too large, and consumption is increasing too rapidly. Already about one-third of the timber used in Japan must be imported. Large quantities of timber for building purposes come from the United States, Canada and Siberia, and for wood pulp and matches from Siberia. The paper mills of Hokkaido are securing a part of their supply of timber for pulp from Sakhalin and Kamchatka. Japan is in a distinctly advantageous position for the importation of timber. Not only is there cheap water transport from the forests of the Pacific Slope of the United States and Canada, but near at hand is the great coniferous forest of eastern Siberia, probably the world's largest remaining forest reserve. With the extension of railway lines, there will undoubtedly be a development of the lumber industry in the forests of eastern Manchuria. Already agreements have been entered into between the Japanese and the Chinese governments for the exploitation of the forests on the Yalu River and in the Manchurian provinces of Heilungkiang and Kirin.[1]

A world scarcity of timber seems to be imminent, and Japan is as well situated as any country to meet it. The shortage will certainly be no more severe in Japan than in most industrial countries, and it will be less severe than in those countries that have given little thought to the conservation of their own reserves and are not so favorably located to secure their requirements by importation.

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[1] JOHN V. A. MACMURRAY, Treaties and Agreements with and concerning China, 1894–1919, pp. 731, 1434.

WATER POWER

Water power is another gift of Japan's mountains. Topography and climate have combined to endow the country with a resource of great importance. The rugged surface of the islands limits agriculture and makes transportation difficult, but it gives a high velocity to the streams. The rainfall is heavy throughout Japan, ranging from a maximum average of 100 inches per year along the southern coasts to a minimum of 30 inches in Hokkaido. The heaviest rain is on the eastern and southern slopes of the mountains of central Honshiu, but the more abrupt drop in gradient is on the northern and western sides toward the Japan Sea. Most of the larger power sites are located along the streams rising in this well-watered mountain mass. The more important are the Tenryu, Fuji, Kiso, and Yado rivers flowing into the Pacific Ocean and the Shinano, Akano, Jintsu, Kurobe, Joganji, and Mogami rivers flowing into the Japan Sea.

As in all lands under the influence of monsoonal winds, the rainfall of Japan is seasonal with the maximum coming in the summer months over most of the area of the islands. There is no dry season, however, and the lighter rainfall of the winter months is compensated for somewhat by the lower rate of evaporation. Along the western side of Honshiu, there is an exception to the general summer maximum, since the winter winds blowing out of the Asiatic continent and across the Japan Sea concentrate the heavier precipitation in the cold months. It is in the form of snow and it accumulates to a great depth, especially in the higher mountains. The melting of the snow in the warmer months gives to the streams of the western coast an evenness of flow that adds greatly to their value for water power.

The lakes of the Japanese mountains, especially the two large lakes, Biwa and Inawashiro, provide natural storage, and the topography is suitable for the economical construction of reservoirs if they are required. The streams, because of their small size and the many rapids, are usually not navigable, and the development of water power is not restricted by the necessity of protecting navigation.

The water power sites are the property of the government, irrespective of the ownership of the land along the streams. Development is on licenses issued by the prefectural governor with the approval of the Ministers of Communications and Home Affairs of the Imperial Cabinet. Under such an arrangement, there is at least the opportunity for development without waste and costly competition and with the maximum utilization of the possibilities.

An official survey of the water power resources of Japan was completed in 1923. The potential power available on the basis of the "minimum flow" of the streams was estimated at 6,415,000 horsepower. An estimate on such a basis is very conservative. It is the amount of power that could be depended upon throughout the year even if the streams should remain at their lowest stage. On the basis of the stream flow for the lowest six months, the amount of power available was estimated at 14,090,000 horsepower.[2]

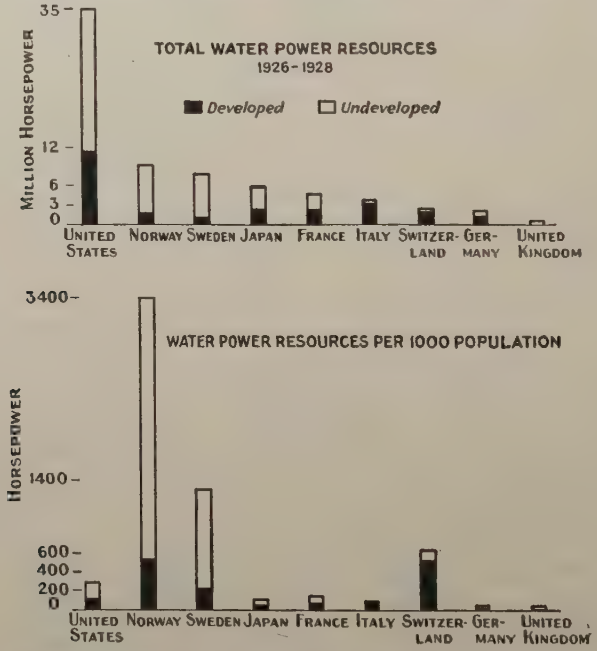

FIG. 97.—Japan ranks high in total water power resources, but her position is less significant if considered in relation to her population.[1]

For the area of the country, Japan is rich in water power. Japan is often referred to as the England or Great Britain of Asia, but aside from such obvious similarities as their island character, their position in close proximity to a large continent, and the density of the population, the two countries have few points of resemblance. In materials for manufacturing industry and in fuel, Great Britain is much richer. In water power alone, Japan has the advantage. Great Britain with short streams and few high mountains has, it is estimated, only about

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[1] Data from U. S. Commerce Yearbook, *op. cit.*, Vol. II, 1929, p. 734.

[2] Japan, Bureau of Electricity, Report, 1926.

850,000 horsepower in potential water power. Japan ranks with such countries as Norway, Sweden, France, and Italy in water power resources in relation to area, but is of less importance in water power in relation to population (see Figure 97).

The first hydroelectric plant in Japan was constructed in Kyoto in 1891 on a stream flowing from Lake Biwa. Since that year, development has been rapid. The generating capacity of the hydroelectric stations of the country was 1,955,000 horsepower in 1924[1] and by 1927 it had increased to 2,830,000 horsepower. Hydroelectricity has become an important source of power in Japan, and of the total electric power production about 60 per cent is developed by water power plants.[2] Most of the installations, as is indicated on the accompanying map (Figure 98), are in central and eastern Honshiu in the area tributary to Tokyo and not in the area of greatest industrial expansion around Osaka. The concentration in the Tokyo area is explained partly by the fact that Osaka is one of the older industrial centers, and the dependence on steam plants for power was well established before the large scale generation and distribution of hydroelectric power began. In addition, Osaka is situated on the Inland Sea, and coal can be brought in more cheaply from the fields of northern Kyushu than is possible in the Tokyo area. The concentration of the hydroelectric plants near Tokyo is further explained by natural conditions which are more favorable to water power development. In a report of the Electricity Bureau, it was stated that the potential water power within 150 miles of Osaka totaled 1,691,128 horsepower, and within the same distance of Tokyo, 3,913,647 horsepower.[3]

The development of hydroelectric power in Japan has been mainly for industry and for urban transportation and light in the homes. In no other country, probably, is the use of electricity for lighting so general. At the end of 1926, there were installed in Japan 30,000,000 electric lamps, or an average of 2½ lamps per household. The lights are not confined to the large cities, but are to be found in almost every village and even in isolated farmhouses in the midst of rice fields. Of the total lamp installations in 1926, only 23 per cent were in the eight largest cities of the country.[4]

Various schemes are being considered for the consolidation and further development of the electrical power industry of Japan. One proposal provided for the electrification of the government railway lines, the power to be supplied by hydroelectric and steam plants to be established by a semipublic company with a capitalization of $50,-

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[1] *Op. cit.*

[2] Mitsubishi *Monthly Circular*, *op. cit.*, p. 9, March, 1929.

[3] Bureau of Electricity, *op. cit.*

[4] *Japan Advertiser, Annual Review*, *op. cit.*, p. 36, 1928–1929.

000,000. The dividends on the non-governmental shares of the company were to be guaranteed by the government. The surplus power was to be sold to private consumers. A more recent proposal is more elaborate. It provides for the organization of a semipublic corporation with a

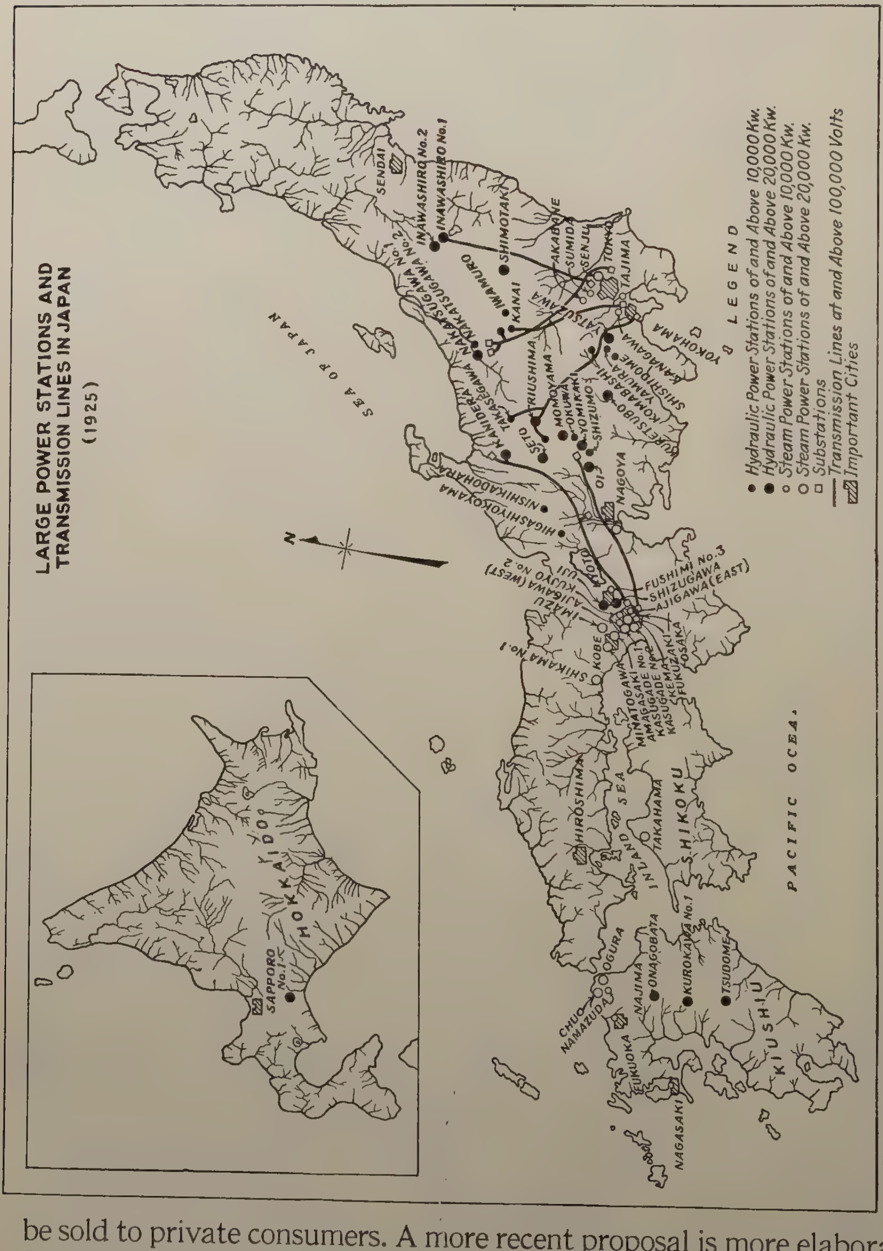
LARGE POWER STATIONS AND TRANSMISSION LINES IN JAPAN
(1925)
LEGEND
• Hydraulic Power Stations of and Above 10,000 Kw.
● Hydraulic Power Stations of and Above 20,000 Kw.
○ Steam Power Stations of and Above 10,000 Kw.
○ Steam Power Stations of and Above 20,000 Kw.
□ Substations
— Transmission Lines at and Above 100,000 Volts
▨ Important Cities
SEA OF JAPAN
PACIFIC OCEAN
INLAND SEA
N
SENDAI
INAWASHIRO No.2
INAWASHIRO No.1
SHIMOTAKI
IWAMURO
KANAI
AKABANE
SUMIDA
SENJU
TOKYO
TAJIMA
YOKOHAMA
KANAGAWA
SHISHIDOME
YAMBURA
KOMABASHI
YATSUZAWA
RIUSHIMA
MOMOYAMA
OKUWA
YOMIKAKI
SHIZUMO
TOKETSUBO
SETO
OI
NAGOYA
KAMIDERA
NAKATSUGAWA
NISHIKIDOHARA
HIGASHIYOKOYAMA
KYOTO
UJI
KUJUYO No.2
AJIGAWA (WEST)
IMAZU
FUSHIMI No.3
SHIZUGAWA
AJIGAWA (EAST)
SHIKAMA No.1
KOBE
OSAKA
MINATOGAWA
AMAGASAKI No.1
KASUGADE
KEMA
FUKUZAKI
HIROSHIMA
TAKAHAMA
SHIKOKU
OGURA
CHUO
NAMAZUDA
FUKUOKA
NAJIMA
ONAGOBATA
KUROKAWA No.1
TSUDOME
NAGASAKI
KIUSHIU
HOKKAIDO
SAPPORO No.1

FIG. 98.—The hydroelectric plants are situated in the mountains of central Honshiu tributary to Tokyo and Osaka. Osaka is dependent very largely upon steam plants. (Map published in Japan, Report of the Bureau of Electricity, *op. cit.*, 1926.)

capitalization of between $150,000,000 and $250,000,000 to purchase the power stations and transmission lines of the six largest electrical companies of the country.[1] Whether one of these plans or some other is adopted, it would seem that the government realizes the importance of eliminating wasteful competition and of promoting the economical and efficient utilization of the water power resources.

Water power is one of the few assets of Japan for industrialization, but the resources are not unlimited. Because of the scarcity of coal, these resources should be developed to the fullest possible extent, but they cannot be expected to free Japanese industries of all worries regarding power. In the first place, all of the power will not be available for manufacturing. Not only will there be an increasing demand for power for domestic needs and for transportation, but a large amount will be consumed in agriculture. In addition to the ordinary uses of power about the farmyard, there is an increasing dependence upon electric pumps for the draining and irrigating of land, as is illustrated in the accompanying map (Figure 99) showing the distribution of electric pumps in a portion of the delta of the Chikugo River near Saga, Kyushu. Electric power will also be used in increasing quantities in the rearing of silkworms and in the reeling of raw silk. The consumption of power in agriculture will provide a market for the surplus power that can be generated during the maximum flow of the streams in the summer rainy season.

The unexploited reserve of water power is not large in comparison with the present consumption and is not sufficient to meet any great increase in demand. By the development of all the hydroelectric power that can be depended upon continuously throughout the year, the power supply now being derived from both coal and water power would be increased only by 45 to 60 per cent, depending upon the conversion figure used. If all the water power estimated to be available on the basis of the six months of minimum stream flow—a maximum estimate—should be developed, the additional power resources would be less than twice the present consumption. The per capita power resources would still be small, much below the resources of the great industrial countries—the United States, Germany, and England. Though Japan is richly endowed with water power in comparison with other areas of equal size, the resources are not large enough to offset materially any deficiencies in coal, and power will undoubtedly be one of the factors restricting Japanese industrial expansion. Despite its limitations, however, water power is destined to play a part in the advancement and directing of the industrialization of Japan comparable in its significance to the influence of coal in the Industrial Revolution in England. There will be a more detailed discussion of this point in a later chapter.

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[1] *Trans-Pacific, op. cit.,* Jan. 19, 1929.

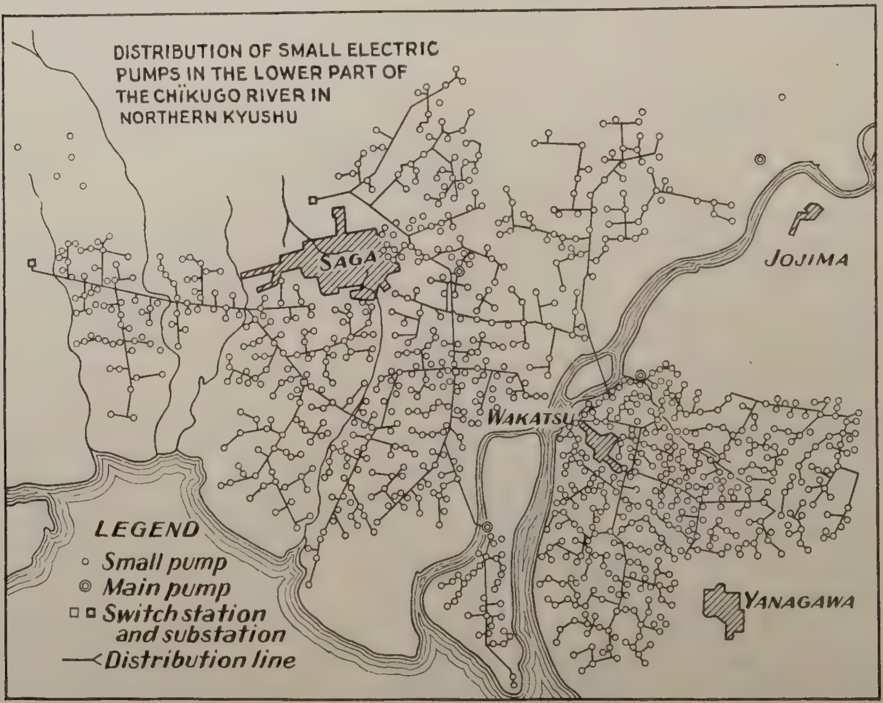
DISTRIBUTION OF SMALL ELECTRIC PUMPS IN THE LOWER PART OF THE CHÏKUGO RIVER IN NORTHERN KYUSHU
SAGA
JOJIMA
WAKATSU
YANAGAWA
LEGEND
○ Small pump
◎ Main pump
□ ▪ Switch station and substation
—< Distribution line

FIG. 99.—The small electric pump has come to be an important aid to the farmers in the irrigation of rice fields.[1]

MINERAL RESOURCES

In the western countries, the possession of mineral resources has been one of the most important factors in industrialization. The countries with large deposits of the two essential minerals, coal and iron ore—the motive power and the sinews of modern industry—have become industrially powerful. They are the basis of the strength of the United States, Great Britain, and Germany in manufacturing. Other nations not so richly endowed have had to be content with a secondary position. Japan is not without mineral wealth, but the resources are not large and the reserves of coal and iron ore are especially inadequate. The poverty of minerals is Japan's most serious handicap for industrialization.

[1] Map published in Japan, Report of the Bureau of Electricity, *op. cit.*, 1926.

Copper

The value of all the minerals mined in Japan in the five years ending with 1928 averaged only $193,000,000 a year, or one-fifth the average annual value of the rice crop for the same period. Coal accounted for 63.6 per cent of the value of the mineral output, and the only other mineral of major importance was copper, constituting 13.3 per cent of the total value. Copper mining is an industry of great antiquity in Japan. By a law promulgated in 716, severe punishments were commuted if those sentenced to death or banishment offered to the government a specified quantity of copper.[1] The metal was an important medium of early Japanese art. It was used in the construction of palaces, shrines, and temples, and in the alloy bronze in the casting of huge bells and the images of the Buddha. The Japanese developed a very high degree of skill in working in copper and bronze and in inlaying them with the more precious metals. During the centuries of isolation, copper was practically the only commodity exported from the islands, and it was the magnet that attracted and held the Dutch and the Chinese traders despite the restrictions, often humiliating, that were placed upon them. After the opening of the country to trade, the output and export of copper increased though copper was almost immediately dwarfed in importance as an export by raw silk and other commodities.

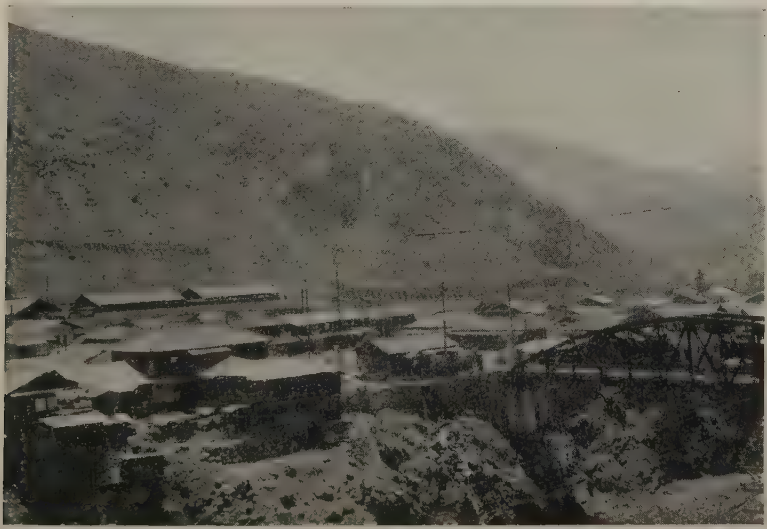

FIG. 100.—To prevent erosion the slopes around Ashio, denuded by the smelter fumes, have been covered by a woven network of grass.

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[1] Mining in Japan, *op. cit.*, p. 1.

Copper is found in workable deposits in many places throughout the Japanese islands from Hokkaido to Kyushu, but most of the output at present comes from the five large mines included in Table XIV. They yielded about 75 per cent of the total output of the country in 1924.

TABLE XIV.—COPPER OUTPUT OF PRINCIPAL MINES OF JAPAN, 1924[1]

Mines	Prefecture	Output, pounds
Ashio	Tochigi	30,800,000
Besshi	Ehime	22,000,000
Kosaka	Akita	18,510,000
Saganoseki	Oita	16,600,000
Hitachi	Ibaraki	16,550,000

[1] Japan, Department of Mines, Production of Minerals and Metals (in Japanese), 1924.

For many years, Japan ranked second to, though far below the United States in copper output. In more recent years, especially during and since the World War, other countries have increased their output rapidly, and the Japanese output has remained stationary or has even declined. Japan had fallen to fourth place in 1927, being surpassed not only by the United States but also by Chili and Canada. Since 1917, there has been a sharp decline in the Japanese exports of copper, and since 1919 they have been exceeded by the imports. Japan exported 2,980 tons of copper in 1928 and imported over 20,000 tons.[1] It is difficult to determine to what extent this decline in output and exports is due to the exhaustion of the Japanese deposits and to what extent to the collapse of the world copper market in the years following the war with the resulting low level of prices.

It is impossible to make any accurate estimate of copper reserves. Most of the larger Japanese copper mining companies have proved and developed a five-year supply, and it is their usual practice to maintain exploration work that much in advance of mining operations, but such preliminary work offers no indication of the total reserves available. It seems certain, however, that even though there may be a relative decline in world importance and in exports, Japan will continue to meet her major requirements for copper from her own mines for many years. If the output should prove to be insufficient, the shortage will have little effect upon industrialization, for copper is one of the more valuable metals and can be transported economically. Both Germany and Great Britain produce no copper, and Germany, especially, has become one of the world leaders in industries that consume large quantities of copper, such as the electrical equipment industry.

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[1] Japan, Department of Finance, Monthly Returns of the Foreign Trade of the Empire of Japan, December, 1928.

The possession of copper has undoubtedly aided the growth of the electrical equipment industry in Japan, an industry that will become of increasing importance with the further development of the water power resources of the country whether the domestic supply of copper proves to be adequate or not.

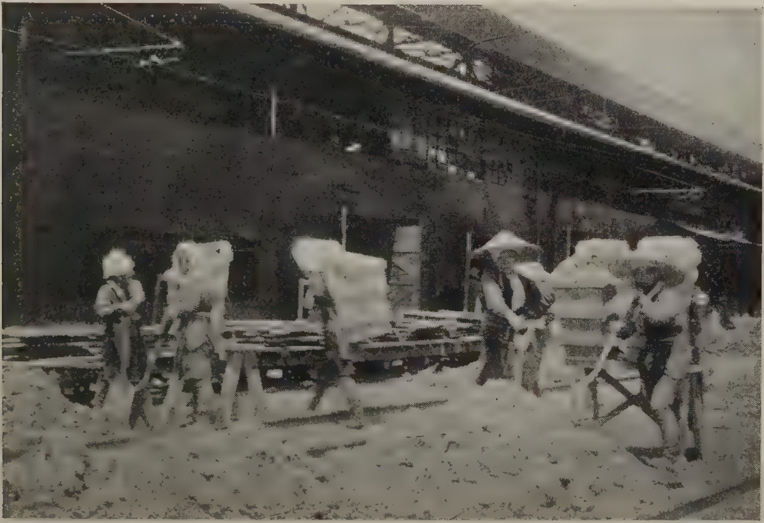

FIG. 101.—Women workers at the Ashio copper smelter transport clay for the furnace linings from a near-by hill.

Other Non-ferrous Metals

Gold to the value of six or seven million dollars and silver to the value of two or three million dollars is mined each year in Japan.[1] The output of the precious metals, though of importance to the Japanese financial system, can have little significance in the development of industry. Small quantities of lead, zinc, and tin are mined, but though there has been some increase in their output in recent years, it is unlikely that production can be increased to meet domestic demand. They are all minerals, however, of sufficient value in relation to their bulk to be imported economically and their scarcity in a country does not hamper industry seriously.

Sulphur

Sulphur, because of its use in the manufacture of sulphuric acid, is one of the basic industrial minerals. Because the acid is difficult and dangerous to transport and because the sulphur is bulky, it is a valuable resource for a nation to possess. It is used in the fertilizer industry, an industry of especial importance in Japan with its intensive agriculture. Due to the volcanic nature of the islands, sulphur is abundant in Japan. It is the nation's most important non-metallic mineral other than the fuels. The deposits occur in connection with the chain of volcanic formations extending from northern Hokkaido to the southern part of Formosa. They have been worked for a very long time, and in 1924, an output of 46,000 tons was reported from 15 localities, most of them situated in Hokkaido and northern Kyushu.[1] The output in 1928 was 70,000 tons.[2] Formerly, considerable quantities were exported, but in recent years the exports have declined due to the very much lower production costs in the easily worked Texas and Louisiana deposits. Japan ranked third among the countries of the world in sulphur output in 1927, though it is a ranking of little meaning, since the United States produced 84 per cent of the total world output and Japan only 2.3 per cent.[3] Because of the relatively high mining costs, the Japanese output may be expected to decline still further. Despite the bulkiness of sulphur for transportation over long distances, it would probably be more economical for Japanese industries and consumers to turn from the sulphur mined in the country to supplies imported from the United States. The domestic supplies will serve, however, as a reserve to be used in case of any interruption of world trade. Some sulphuric acid can be produced as a by-product of the copper smelters, but because of the difficulty of transportation, it will probably have to be used near the point of production.

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[1] Statistics of the Department of Commerce and Industry, *Op. cit.*, p. 64, 1928.

Clay and Sand

Japan has at Seto near Nagoya in Aichi Prefecture a large reserve of kaolin or pottery clay of fair quality, and in northwestern Kyushu at Arita and Saga there are smaller reserves of a finer quality. The deposits are ample for a long period at the present rate of consumption. The expansion of the pottery industry will be limited, not by raw materials, but by the development of markets abroad for the Japanese product. There appear to be ample supplies of sand for the ordinary varieties of glass, but for the finer qualities silver sand must be imported from France and Belgium. There is no scarcity of stone for buildings or of clay for brick making or of the materials for cement manufacture.

CHEMICAL MATERIALS

With the exception of sulphur and the coal derivatives, Japan Proper has few of the raw materials for the chemical industry. There are beds of phosphate rock in northwestern Honshiu and in southern Kyushu, and more important deposits are known to occur in some of the small islands controlled by Japan or under Japanese mandate. These deposits are being worked, but the greater part of the bulky inorganic fertilizer materials consumed in the country—the compounds of potassium, nitrogen, and phosphorus—must be imported.[1]

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[1] Production of Minerals and Metals (in Japanese), *op. cit.*

[2] Statistics of the Department of Commerce and Industry, *op. cit.*, 1928.

[3] International Statistical Year-Book, *op. cit.*, 1928.

Salt is used by man to flavor and to preserve his food. It is also one of the basic materials of the chemical industry, for from it are secured the sodium and chlorine that enter into many compounds. Japan produces each year, chiefly through the evaporation of sea water, over 600,000 metric tons of salt. Another 200,000 tons is imported, and there is an additional import of about 100,000 tons of sodium compounds, the derivatives of salt. The output of salt could probably be increased if necessary to meet the needs of Japan, but the cost of production is apparently a limiting factor. The joint Sino-Japanese commission appointed under the treaty for the settlement of the Shantung controversy of June, 1922, agreed that for a period of 15 years Japan could purchase between 70,000 and 245,000 tons of salt annually from the salt industry located on the coast of Kiaochow Bay.[2]

To summarize the inventory of the raw materials for manufacture as it has progressed to this point, the most important resource of Japan is raw silk. The output is ample for any possible development of silk weaving. The fibers for the other textile industries must be imported. The timber resources are large but the import of both lumber and pulp wood is necessary. Of the minerals so far discussed, only salt, copper, and sulphur could be produced in sufficient quantities to supply the needs of the country. The Japanese islands are richly endowed with water power, but if manufacturing continues to develop the resource will soon be inadequate to meet the power requirements.

It would appear that few of the raw materials reviewed in the present chapter are really vital in the locating of manufacturing industries. They are an asset to the country possessing them, but, in general, they are materials of relatively small bulk and high value, and they can be imported, providing other factors favor the development of industries. Much more essential to industrialization are iron ore and coal, both bulky materials that cannot be transported long distances economically. In the following chapters will be discussed Japan's supply of these two commodities.

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[1] Mitsubishi *Monthly Circular*, *op. cit.*, June, 1928, pp. 19–21.

[2] WESTEL W. WILLOUGHBY, Foreign Rights and Interests in China, p. 329.

CHAPTER XVI

THE IRON ORE AND FUEL RESOURCES OF THE JAPANESE EMPIRE

OUR modern civilization differs from other civilizations mainly in the use of engines and machines. Iron is the most important material entering into their construction, and the greater part of the power to drive them, probably as much as 85 per cent, is derived from the hydrocarbons—coal, petroleum, and natural gas. The nation with adequate supplies of iron ore and fuel is fortunate, for it is assured of a cheap construction material and cheap power for its industries and its transportation systems. The nation with deficient supplies of the one or the other has a severe handicap, for both are bulky, and transportation adds greatly to their costs. No nation, no matter how energetic its people, has been able to reach a position of major importance in manufacturing without adequate resources of these two essential materials. Japan has practically no iron ore, and her reserves of coal are small and not of the best quality for industrial needs. Her poverty in these two materials must inevitably limit Japan in the realization of her industrial ambitions.

IRON ORE RESOURCES

The output of pig iron is considered an excellent barometer of business conditions; the magnitude of the iron and steel industry possessed by any country may be taken as a measure of its industrial progress. So insistent and so numerous are the demands of present day manufacturing, transportation, and construction for iron and steel that an industrial nation must have a high degree of independence in their production.

An iron and steel industry requires iron ore that can be handled easily and economically in the blast furnace, and coal that can be made into a strong coke. It also requires limestone, manganese, nickel, chromium, vanadium, and numerous other alloys to produce special steels. With regard to the second group of materials, Japan has little cause for worry. There seem to be within the country beds of limestone ample for all probable needs, and manganese and some of the alloys have been mined. In normal times, it is cheaper to import the major requirements of the alloys, both because of the superior quality of the foreign products and because of their lower costs of production. Since they are not used in large quantities, the expense of their importation does not add too greatly to their price in Japan. The ferro-alloys are not a vital factor in the locating of the iron and steel industry. All of the great iron and steel producing nations—the United States, England, Germany, France—import manganese and the other alloys from Russia, India, Brazil, Peru, New Caledonia, and other distant countries.

Japan does not have adequate supplies of the two essential bulk materials, iron ore and coal, especially the former. Iron ore deposits are widely scattered throughout the Japanese islands. They were the source of the ore used in the manufacture of the swords and armor of the feudal period, but with few exceptions, because of their small size and the character of the ore, they are of no value for a modern industry. The iron ore resources of Japan Proper have been carefully studied by the Imperial Geological Survey, and the total reserves have been estimated at 80,000,000 tons.[1] It is probable, however, that not more than half of this total can be considered as utilizable ore for modern furnaces.[2] This reserve is entirely too small for an industry of any size. During the last 10 years, the annual consumption of iron ore in the United States has ranged from 30,000,000 to 75,000,000 tons. In other words, the total known iron ore reserves of Japan Proper would supply the blast furnaces of the United States for slightly more than one year and the utilizable ore would be sufficient for not more than six months' consumption.

There are only two iron ore deposits in Japan that are workable under present conditions. The more important is the bed of magnetite situated near Sendai on the east coast of Honshiu, and the other is a bed of limonite near Muroran, Hokkaido. The magnetite deposit supplies the ore for the nearby iron and steel works of the Kamaishi Mining Company. The deposit is estimated to contain about 15,000,000 tons of ore ranging from 50 to 60 per cent iron content and possibly an additional 35,000,000 tons of lower grade ores that cannot be worked economically at present. The limonite is used in the blast furnaces of the Japan Steel Works at Wanishi, Hokkaido. It occurs in a number of deposits that are estimated to contain a total of about 10,000,000 tons of ore of 40 to 50 per cent iron content. During the five-year period 1923 to 1927, the combined annual output of the magnetite and limonite deposits averaged only 96,000 tons.[3]

[1] F. R. TEGENGREN, The Iron Ores and Iron Industry of China, Memoirs of the Geological Survey of China, Series A, No. 2, Part II, p. 408, 1923.

[2] U. S. Bureau of Foreign and Domestic Commerce, Trade Information Bulletin, 573, Raw Materials Entering into the Japanese Iron and Steel Industry, J. H. EHLERS, p. 2, 1928.

[3] *Op. cit.*

It seems likely that the estimates of the ore reserves of Japan have been somewhat exaggerated and that they are not sufficient for any considerable output. Even during the period of the World War when the iron and steel industry was very active and prosperous and there was an insistent demand for ore at almost any price, the maximum annual output of the Kamaishi mine was less than 150,000 tons, attained in 1917, and of all the Japanese mines, less than 380,000 tons. The failure of the mines to respond to such a stimulus as the war provided is good evidence of their poverty. The Japanese output of iron ore is now substantially the same as during the years before the World War, and in 1927 totaled only 159,000 tons.[1]

As a result of the scarcity of iron ore and also to conserve fuel, the Japanese industry makes considerable use of scrap iron in the manufacture of steel. In recent years, the tonnage of scrap consumed has amounted to from 60 to 70 per cent of the total pig iron output,[2] a percentage somewhat higher than is usual in a country with adequate supplies of ore. Japan is not, however, in a particularly favorable position to obtain scrap for any great expansion of the steel industry. The domestic supply is inadequate and the neighboring Asiatic countries are small consumers of iron and steel and therefore small producers of scrap iron. Scrap in quantity can come only from distant North America or from Europe.

Iron Sands

Many claims have been made regarding the magnitude of the deposits of iron sands situated along the coasts of the Japanese islands, and many optimistic and often extravagant statements have been published on the possibility of utilizing such deposits successfully as a source of ore for the iron and steel industry. One of these iron sand deposits, situated on Kuji Bay in northwestern Honshiu, has been known and worked to some extent at least since 1650. For modern practice, the deposit presents two technical problems—the concentrating of the ore and the eliminating of the titanium. For several years, the company operating the deposit experimented with a process of making sponge iron briquets from the sands and then using the briquets in the open-hearth furnace for the making of steel. Though technically possible, the process has apparently not been successful economically. The plant has been closed since August, 1928, and at the beginning of 1929 the subsidy of $50,000 a year that was being advanced to it by the Japanese government was terminated.[3] It is conceivable that a successful process of utilizing the iron sands may eventually be perfected, but even so, it is not likely that they will ever form the basis for a large iron and steel industry, for, as Bain has pointed out, it has been world-wide experience that such sands are much less abundant than first appearances indicate.[1]

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[1] *Op. cit.*, p. 6.

[2] *Op. cit.*, p. 17.

[3] *Japan Advertiser, Annual Review op. cit.*, p. 46, 1928–1929.

The other iron ore deposits of Japan are of little importance. Their reserves are too small to warrant the construction of blast furnaces at the mines, and in most cases the ores, because of their low grade and the costs of transportation, cannot be hauled to some centrally located plant.

It is evident that the iron ore resources of Japan Proper are entirely inadequate even to meet the present domestic demands. Ehlers has estimated that about 3,000,000 tons of ore would be required to manufacture the iron and steel now consumed annually in Japan.[2] If the attempt were made to supply these requirements from Japanese sources, the estimated utilizable ore would be exhausted in 13 years and the estimated total reserves, including the ore of low grade, in about 25 years. There is little likelihood that additional reserves of any great magnitude will be discovered in the Japanese islands, for iron ore is so vital a commodity that the search has been most intensive and thorough. The present iron and steel industry is based, for the most part, upon ores that have been imported from the Asiatic mainland, and any future expansion of the industry must depend upon an assured and increased supply of ore from foreign sources. The iron ore reserves of the remainder of the Japanese Empire and of the adjacent sections of the Asiatic mainland will be considered in later paragraphs, but first the reserves of fuel—coal and petroleum—in Japan Proper must be examined.

COAL RESOURCES

The coal reserves of the Japanese islands, including Karafuto and Formosa, were estimated at 7,970,000,000 tons in 1913 by Kinosuke Inouye, then Director of the Imperial Geological Survey.[3] They have been depleted to some extent since that estimate was made and now probably contain about 7,346,000,000 tons. The coal is only of fair quality. Almost 90 per cent of the total is sub-bituminous or a bituminous of low rank. There is very little anthracite and only a few deposits yield a coal that will make a satisfactory metallurgical coke.

The estimate of reserves may appear at first glance to be large and quite adequate for the demands of industry, but the Japanese coal reserves are in reality small for so large a population, and in per capita reserves Japan ranks far below the leading industrial countries. In Figures 102 and 103, the total and the per capita coal reserves of a number of countries are presented graphically. Japan has only 118 tons per capita in comparison with 4,070 tons per capita for the United Kingdom, 3,921 tons for Germany, 27,501 tons for the United States, 413 tons for France, 2,211 tons for China, and 179 tons for British India. Of the countries of any industrial significance, Italy alone has a smaller reserve. Even at the present rate of output, Japan's supply of coal will be exhausted in less than 200 years and at the per capita rate that coal is being consumed, say in Germany, the smallest coal consumer of the three leading industrial countries, the reserves would be exhausted in about 40 years. The supply of coal is not sufficient for any large development of industry and, if industrialization is to progress in Japan to anything like the degree it has in western countries, either coal must be imported or a new source of power must be discovered.

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[1] H. Foster Bain, Ores and Industries of the Far East, p. 99.

[2] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 19.

[3] Coal Resources of the World, *op. cit.*, Vol. 1, pp. 278–348.

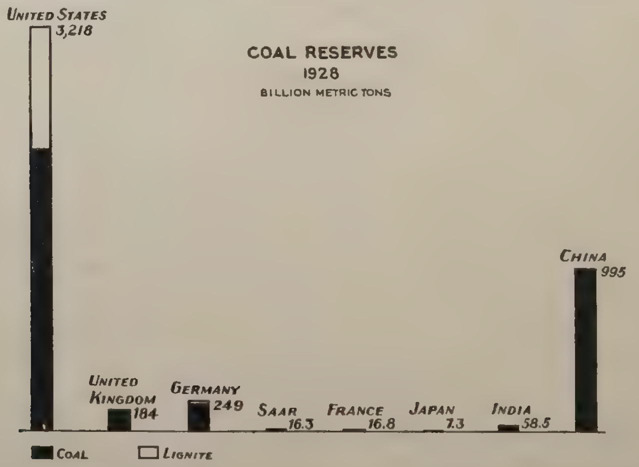

FIG. 102.—Japan's share of the world's coal reserves is extremely meager.[1]

In a previous chapter, attention was directed to the fact that the present consumption of coal in Japan is relatively small. With such limited reserves, there is little possibility of any great increase in output even with the increasing demands of industry. The trend of output in the last few years, as presented in Table XV, would seem to reflect the constricting influence of the small reserves.

In the 17 years from 1912 to 1928, there was an increase of 96 per cent in the consumption of coal in Japan. The increase was supplied mainly by the 61 per cent increase in output, but an increase in imports

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[1] Data from Coal Resources of the World, *op. cit.*, adjusted and brought up to date by the author.

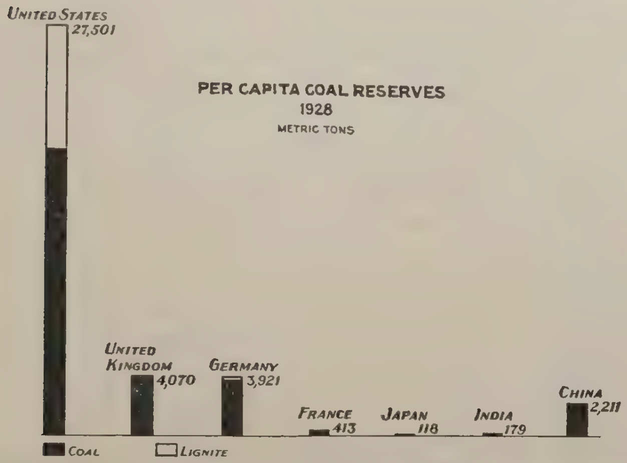

FIG. 103.—The limited per capita coal reserves of Japan will not permit any great increase in consumption.[1]

and a decrease in exports have also contributed. The Japanese mines alone were not able to meet the increasing demand. Of the 15,800,000 tons increase in consumption, 76 per cent has been supplied through an increase in the Japanese output, but the remaining 24 per cent has had

TABLE XV.—COAL OUTPUT AND CONSUMPTION IN JAPAN, 1912 TO 1928[1]
(Thousand metric tons)

Year	Output	Imports	Exports	Consumption in Japan
1912	19,640	311	3,500	16,451
1913	21,316	582	3,905	17,993
1914	22,293	966	3,611	19,648
1915	20,491	620	2,946	18,165
1916	22,902	562	3,041	20,423
1917	26,361	720	2,839	24,242
1918	28,029	775	2,219	26,585
1919	31,271	712	2,038	29,950
1920	29,245	810	2,162	27,893
1921	26,221	790	2,429	24,582
1922	27,702	1,189	1,720	27,171
1923	28,949	1,712	1,601	29,060
1924	30,111	2,030	1,740	30,401
1925	31,459	1,771	2,740	30,490
1926	31,427	2,041	2,631	30,837
1927	33,531	2,710	2,209	34,032
1928	31,615	2,780	2,185	32,210

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.;* Statistics of Agriculture, Industries, and Commerce, *op. cit.*, 1923; Statistics of the Department of Commerce and Industry, *op. cit.*, 1927; *Japan Advertiser, Annual Review, op. cit.*, 1928–1929.

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[1] Data from Coal Resources of the World, *op. cit.*, computed and brought up to date by the author.

to be met by readjustments in trade—a decrease in exports and an increase in imports. It should be added, however, that during the very severe industrial depression of the last few years there has been an oversupply of coal for the market, and some restrictions on output have been necessary. For example, the Union of Coal Associations of Japan attempted in 1928 and 1929 and again in 1930 to limit the supply of coal by agreeing to restrict the quantity available for marketing by from 5 to 10 per cent.[1] The inability of the Japanese market to absorb the rather moderate increase in coal output is evidence both of the depressed state of manufacturing industry and of the slow progress of industrialization. During the years of overproduction and restrictions, the imports of coal have increased, for Japanese coal is not satisfactory for all industrial purposes. The imports have come mainly from China, Manchuria, and French Indo-China.

Probably long before there is any serious coal shortage in Japan, the limited reserves will affect industry through an advance in the price of coal. In coal mining, the law of diminishing returns works surely and swiftly. If the reserves are abundant, it is possible to skim the cream—take only the easily and cheaply mined coal and then shift to a fresh supply—but if the reserves are small, there can be no shifting. The existing mines must be pushed to greater depths and thinner seams must be used. Costs of mining mount, and the price of coal becomes higher and higher.

The Distribution of the Deposits

The coal deposits of Japan are scattered throughout the islands from Sakhalin in the north to Formosa in the south (see Figure 104), but they are much more concentrated than are the iron ore deposits, and mining is for that reason more economical. The two principal deposits are situated in northern Kyushu and in Hokkaido. The two districts are of almost equal importance in reserves, Kyushu possessing 37 per cent of the total coal of Japan, and Hokkaido 34 per cent. There is no such equality in output, however, for Kyushu at present produces about 67 per cent of the annual output, and Hokkaido only 17 per cent.[2] The remaining 16 per cent comes from a number of small deposits of inferior coal in the main islands of Honshiu, the most important of which is the Joban deposit along the east coast about 120 miles north of Tokyo.

The Kyushu deposits are located near the sea and in an area of dense population. The cheap transportation and the market have stimulated mining operations and have made this district the leading producing district of the country. It is believed that mining has been carried on in some of the Kyushu fields for 200 or 300 years, but the output has been large only since the opening of the country and the beginning of industrialization. In Kyushu, there are two coal fields of especial importance, the Chikuho field in the northern part of the island near the Moji industrial district and the Miike field at Omuta some 60 miles to the southwest. The Chikuho field is the leading producing field of Japan, its annual output being over one-third of the total for the country. The Miike field includes the largest single mine in Japan—the Miike mine owned by the Mitsui Mining Company.

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[1] Mitsubishi *Monthly Circular*, *op. cit.*, September, 1928, November, 1928; May, 1929; September, 1929; December, 1929.

[2] Production of Minerals and Metals (in Japanese), *op. cit.*, 1926.

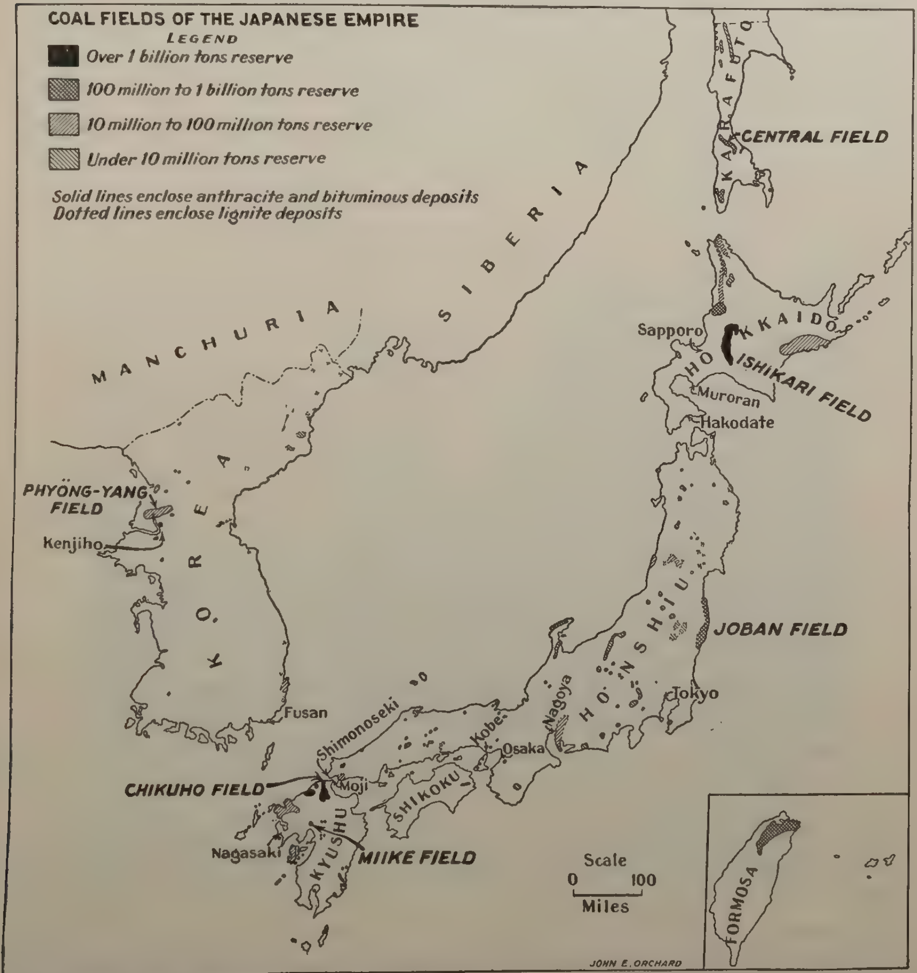
COAL FIELDS OF THE JAPANESE EMPIRE
LEGEND
Over 1 billion tons reserve
100 million to 1 billion tons reserve
10 million to 100 million tons reserve
Under 10 million tons reserve
Solid lines enclose anthracite and bituminous deposits
Dotted lines enclose lignite deposits
KARAFUTO
CENTRAL FIELD
SIBERIA
MANCHURIA
HOKKAIDO
Sapporo
ISHIKARI FIELD
Muroran
Hakodate
PHYÖNG-YANG FIELD
Kenjiho
KOREA
HONSHIU
JOBAN FIELD
Tokyo
Nagoya
Osaka
Kobe
Shimonoseki
Fusan
SHIKOKU
CHIKUHO FIELD
Moji
KYUSHU
Nagasaki
MIIKE FIELD
Scale
0 100
Miles
FORMOSA
JOHN E. ORCHARD

FIG. 104.—Coal deposits are scattered throughout the Empire but the only important reserves are in Hokkaido and Kyushu.[1]

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[1] Data from Coal Resources of the World, *op. cit.*

The smaller output of the Hokkaido deposits is explained by the scanty population of the island and by the poor transportation and also by the fact that the mines were opened only a few years ago. The principal deposit is situated at Ishikari near Sapporo in an inland position about 90 miles by rail from the port of Muroran. It has probably the largest reserve of any single deposit in Japan. It is from the Hokkaido coal fields that any substantial increase in the Japanese output will be secured.

In Karafuto, the Japanese half of the island of Sakhalin, there are some coal deposits of fair quality. The reserves are estimated at 1,400,000,000 tons or 17 per cent of the total for the Empire. There is a possibility of some increase in the estimate with more careful geological investigations. Mining was begun only recently, and at present the output is about 200,000 tons per year. There is also a deposit of coal in the northern part of the island of Formosa near Taihoku, the capital. The reserve is not large and the output is about the same as that of Karafuto. The reserves of these two outlying island possessions are not sufficient to be of any great assistance in meeting the coal deficiencies of Japan.

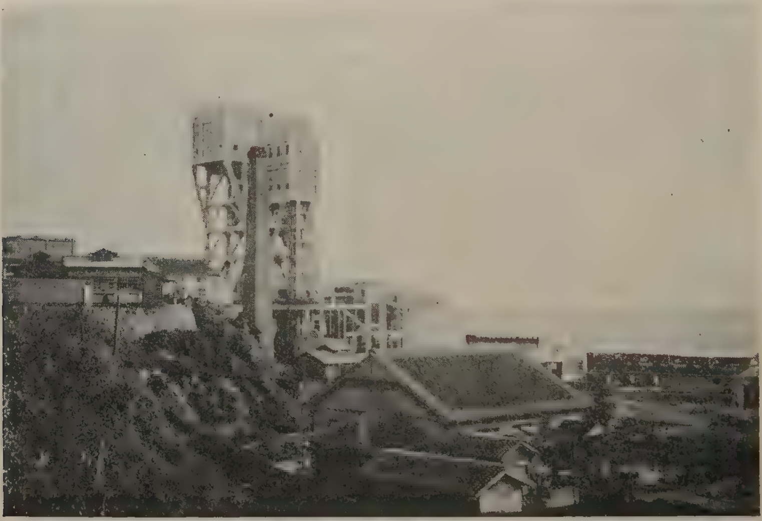

FIG. 105.—Winding house of the Miike mine at Omuta, Kyushu, the largest coal mine in Japan.

The Japanese coal deposits are not located ideally with reference to the present industrial centers. At the time of the opening of the country, as has been pointed out in an earlier chapter, the two factors of prime importance in the location of industry were transportation facilities, especially by water, and the existing concentrations of population. Power was a minor consideration. As a consequence, such manufacturing centers as Osaka, Tokyo, and Nagoya developed. It is about 300 miles from Osaka to the Kyushu coal fields and it is almost 600 miles by sea and rail from the Hokkaido mines to Tokyo, their principal market. With the increasing importance of power in Japanese manufacturing, there has been some relocation of industry, especially of the heavier industries. In northern Kyushu, near both the Chikuho field and the Miike field, there have developed industrial centers for the manufacture of iron and steel, the refining of metals, and cement making. It is probable that a similar development will occur gradually in Hokkaido.

The Scarcity of Coking Coal

Though the Japanese coal reserves are inadequate and ultimately will hamper industrial expansion, the quality of the coal is a matter of greater concern at the present moment than the quantity. It is satisfactory as a steam coal and for the making of gas. It is used for cooking and for heating though charcoal persists as a more popular domestic fuel. Some coal, sufficiently free of sulphur to be used for the firing of pottery kilns, is mined in Kyushu. But Japan has practically no coal suitable for the production of metallurgical coke. The coal from a number of mines in Kyushu and Hokkaido will make coke, but it is a porous coke, and very little of it is hard enough to support the charge of ore and flux in the blast furnace. The coal from the Miike mine, the

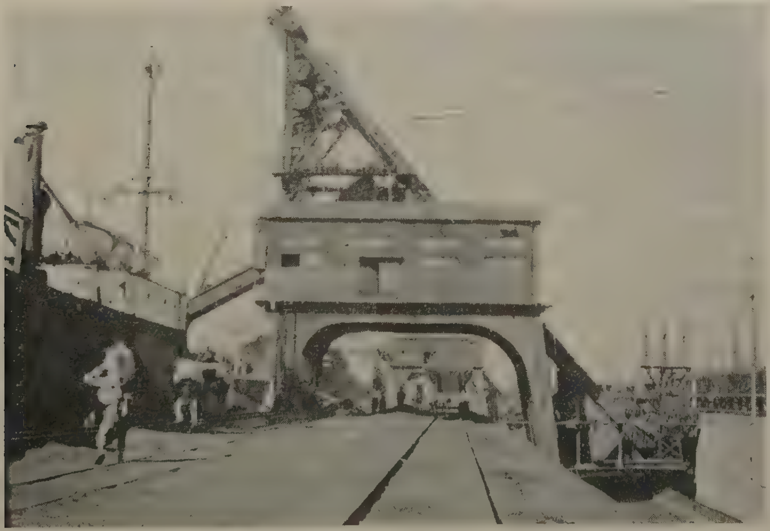

FIG. 106.—Coal loading equipment at the Miike dock.

largest mine in Japan, makes a hard coke, but its sulphur content is so high that it cannot be used in the smelting of iron and is used mainly in the smelting of copper. The Imperial Steel Works at Yawata, the largest consumer of coke in Japan, owns the Futase mine in the Chikuho field of Kyushu and from it secures about 800,000 tons of coal per year. For the making of coke, however, coal must be imported from the Kaiping mine near Tientsin, China to be mixed in the proportions of one part of Chinese coal to four parts of Futase coal.

The necessity of importing the Chinese coal adds materially to the costs of coke making, and the high cost of coke is one of the major problems of the Japanese iron and steel industry. It has undoubtedly retarded the growth of the industry and, perhaps more than any other factor, has made necessary government assistance and has been responsible for the inability of the Japanese producers to compete with the foreign manufacturers of iron and steel. Dr. Ing. E. Kothny has stated that in 1912 the average cost of coke per ton of pig iron was $7.20 in Japan, $3.72 in Germany, and $3 in the United States.[1] The developments of the war and postwar years have brought about no change in the situation. The coke costs were about $7.50 per ton in Japan in 1927 and from $3.25 to $3.50 in the United States. The problem of the future supply of coke and its cost has become so serious that a movement is under way to electrify the Imperial Steel Works at Yawata.

The cost of coke is further increased by inefficiency in its manufacture, by transportation charges, and especially by the price of Japanese coal. Due to more difficult mining conditions, the price of coal is usually somewhat higher in Japan than in the United States. The mines are generally deeper and are in thinner seams, and the structure is badly faulted. Less machinery is used, and the output per miner is very much less. For example, in Japan the average output per miner per day was about ½ ton in 1925 and in the United States it was 4½ tons.[2] This difference in output is only partially offset by the lower Japanese wage scale. Though the output of the Japanese miner is about one-ninth the output of the American miner, he receives a wage that is one-fifth as great.

Though Japan does have much larger reserves of coal than of iron ore, the coal supply, with the very serious shortage of coking coal, is likely to be a factor of even greater significance in limiting the expansion of the iron and steel industry. Coal is much more difficult to transport long distances than iron ore. There is danger of fire, and it deteriorates through breakage in handling, and in the making of 1 ton of steel 2 or more tons of coal are required.[1] Other countries, England, for example, have been able to maintain established iron and steel industries even though it has been necessary to supplement their own depleted resources with large imports of iron ore, but they have had as a basis of their industry supplies of coal adequate in quantity and of coking quality. No country, deficient in both ore and coal, has ever been able to make any significant progress in the development of an iron and steel industry, and it is scarcely conceivable that Japan, a country that seems certain to be in that situation in the near future, will be able to do so.

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[1] *Stahl und Eisen*, June 14 and 21, 1923, translated in *Iron Age*, Nov. 15, Dec. 12 and 20, 1923.

[2] U. S. Bureau of Mines, Mineral Resources of the United States, Part II, p. 437, 1925; Financial and Economic Annual of Japan, *op. cit.*, 1928.

PETROLEUM RESOURCES

Petroleum is supposed to have been the first mineral produced in Japan, for there is a record of the presentation of a quantity of oil from Echigo Province to the Court of the Emperor in 668 A. D.[2] There was little production, however, before the beginning of the modern period. Petroleum is at present the third most important mineral product of Japan. The output reached a high mark in 1916 with 123,750,000 gallons. Since that date there has been a steady decline, and in 1927 the output was only 73,770,000 gallons.[3] Such an output is of no world significance, for Japan is outranked in petroleum production by some 14 countries and her total annual output is only about 70 per cent of the output of the United States for a single day. It is a meager supply for a country with industrial ambitions and is not sufficient for the Japanese consumption. In 1927, it was necessary to import 163,000,000 gallons of crude oil, or more than twice the domestic output. In other words, less than one-third of the Japanese demand for crude oil is met by production within the country. The known reserves are small and in 1924 were estimated to contain only about 30 years' supply even at the present rate of production.[4] Though strenuous efforts have been made in recent years to find new fields, there is little chance of any important discoveries. The Tertiary areas favorable to the occurrence of petroleum are limited to a narrow belt on the western margin of Honshiu and to a few small isolated areas in Hokkaido. The producing fields of present importance are located in Akita and Niigata Prefectures in western Honshiu. The area has been thoroughly investigated though additional reserves may still be found at greater depths. There is a very small production in the Tertiary area of Hokkaido. In the rest of Japan Proper, the geologic conditions are not favorable for the accumulation of oil. The rocks are mainly of volcanic origin or are ancient sedimentaries that have been folded and metamorphosed. A small oil field has been discovered in Formosa, but the geologic formations do not promise any large output.

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[1] In 1926, the Imperial Steel Works consumed 2.6 tons of coal per ton of steel. *Trans-Pacific*, *op. cit.*, Nov. 19, 1927.

[2] Mining in Japan, *op. cit.*, p. 1.

[3] Financial and Economic Annual of Japan, *op. cit.*, p. 64, 1925; Mitsubishi *Monthly Circular*, *op. cit.*, p. 19, May, 1928.

[4] BAIN, *op. cit.*, p. 109.

There is petroleum in the island of Sakhalin, but apparently it is confined to the northern section of the island owned by Russia. In the Japanese section, the rocks are closely folded or are metamorphosed. In the treaty concluded with Russia in 1925, Japanese firms were given the right to secure concessions on petroleum fields in the Russian half of Sakhalin, the Russian government to receive royalties of from 5 to 15 per cent. Concessions have been granted for eight areas and in two of the areas operations have been begun. At the end of 1929, there were 54 producing wells under Japanese control and 5 more were being drilled. Under the terms of the concession, the eight areas are divided into checkerboard squares of 83.7 acres each, and the alternate squares are held by Japanese and by Russian interests. The Japanese are also permitted to prospect in other fields contiguous to the present concessions. A number of difficulties have been encountered in the exploitation of the Sakhalin fields. The wells are not gushers, and the oil must be pumped. The ports of the island are closed by ice for 9 months of the year, and storage facilities must be provided for 75 per cent of the output. The sea along much of the coast is so shallow that even small tankers cannot come within a mile of the shore. The method already in use at Tuxpan, Mexico, has been adopted, and the oil is pumped to the waiting tankers through an 8-inch pipe line laid along the sea floor. Despite all the difficulties, however, the output has increased rapidly since 1926 and in 1929 totaled 175,000 tons, or 17.5 per cent of the consumption of Japan for 1928.[1]

It seems certain that there can be no substantial increase in the production of petroleum in Japanese territory. Korea is composed almost entirely of crystalline and metamorphic rocks, and there is little likelihood of any discoveries of petroleum.[2] Japan must continue to secure from foreign fields her major requirements of this fuel that has become so essential for both land and water transportation. Japan has looked to China for other raw materials, but the geological conditions in that country do not appear to be favorable for any important occurrences of petroleum.[3] It was announced recently that the Japanese government would render aid in the organization of an investment company to acquire oil properties in China, Dutch East Indies, Kamchatka, North America, Mexico, South America, and Turkey.[1] Early in 1930, the organization of the Borneo Oil Company by the Mitsui Bussan Kaisha and the Nippon Oil Company was announced. The new company is to exploit a concession in Borneo granted by the Netherlands India government.[2]

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[1] *Japan Advertiser, Annual Review, op. cit.*, p. 39. 1929–1930.

[2] Bain, *op. cit.*, pp. 108–109.

[3] *Op. cit.*, p. 116.

KOREA AS A SOURCE OF IRON ORE AND COAL

To meet the deficiencies in iron ore and coal, Japan has turned to the mainland of Asia and now obtains supplies of the two materials from different territories over which she exercises varying degrees of control, ranging from complete possession and sovereignty in Korea through leases and concessions in Manchuria to commercial and financial domination over the mineral resources of the valley of the Yangtze Kiang. Korea, Japan's largest colonial possession and the only part of the mainland of Asia completely under her control politically, has been of no value in absorbing the surplus population of Japan, but the attempt is being made to develop the country as a source of raw materials for the Japanese manufacturing industries. Korea possesses deposits of iron ore that are already of importance in supplying the Japanese iron and steel plants. The reserves have been estimated at from 10,000,000 to 40,000,000 tons, and there is a possibility of further discoveries since geological investigations have been by no means as thorough as in Japan. The ore is of fair grade, much of it averaging between 50 and 55 per cent iron content. The deposits are sufficiently large and concentrated to permit the economical mining of the ore. They are located in northwestern Korea near the coast, and cheap transportation to Japan by sea is possible. At present, about one-third of the output is exported as ore to Japan. The remainder is used in the iron industry of Korea. The Japanese government owns the Sainei-men mine which is operated by the Mitsubishi interests and sends ore to the Imperial Steel Works at Yawata. In recent years, the Yawata Works has received from 15 to 20 per cent of its ore requirements from Korea. Some ore is also shipped from Korea to private Japanese plants and to Manchuria.[3]

The Mitsubishi Mining Company purchased the Kenjiho iron mine in Kokai Province in 1911. Other properties were acquired gradually, and the company now owns in Korea seven iron mines, a colliery, and a limestone quarry. The Mitsubishi Iron and Steel Company was organized in 1917 to take over and operate the Korean properties, and in 1918 the first unit of an iron and steel plant was completed at the Kenjiho mine. The plant consists of two blast furnaces with a combined annual capacity of 100,000 tons of pig iron, a battery of 50 by-product coke ovens, 3 open-hearth furnaces of 100,000 tons annual capacity of steel ingots, and a blooming mill, a structural mill, and a plate mill.[1]

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[1] *Trans-Pacific, op. cit.*, Oct. 10, 1929.

[2] *Japan Advertiser, Annual Review*, 1929–1930, *op. cit.*

[3] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 13.

The production of pig iron in Korea has increased gradually, as is indicated in Table XVI, but it is not as yet of any great significance. Most of the output is from the Kenjiho plant of the Mitsubishi Company. In 1926, 89 per cent, in 1927, 78 per cent, and in 1928, 97 per cent (estimated) of the total output of pig was shipped to Japan. Between 1919 and 1922, there was some production of open-hearth steel in Korea, but since 1922 there has been none. The huge steel plant of the Mitsubishi Company has never been successful. It has often been described as a white elephant, has never made any profits, and in most years has been a financial drain upon the company. It is now idle. Despite the efforts being made in Japan to increase the production of iron and steel, conditions in Korea apparently do not favor any expansion of the industry. Korea will continue to produce iron ore and pig, probably in increasing quantities, but it does not seem likely that the country will become important in the production of steel.

TABLE XVI.—PRODUCTION OF PIG IRON IN KOREA[1]
(Metric tons)

1917	2,000	1923	99,000
1918	43,000	1924	100,000
1919	78,000	1925	99,000
1920	84,000	1926	115,000
1921	83,000	1927	129,000
1922	83,000		

[1] TEGENGREN, *op. cit.*, p. 410; Economic History of Chosen, *op. cit.*, p. 36; Japan Year-Book, *op. cit.*, p. 596, 1926; *Japan Advertiser, Annual Review*, *op. cit.*, 1928–1929, p. 24; Mitsubishi *Monthly Circular*, *op. cit.*, June, 1929.

Perhaps the most serious handicap of the Korean iron and steel industry is the inadequate supply of coal. Coal does occur in Korea, and the principal deposits are situated not far from the iron ore, but many of the desposits are of little more than local significance, and the total reserves are small. They were estimated at 80,000,000 tons, including 68,000,000 tons classified as probable, in the report of the Twelfth International Geological Congress.[2] They may be increased somewhat by further investigations, but it is doubtful whether the tonnage will be sufficient to smelt the available supply of iron ore. The present output is about 400,000 tons per year, but in 1927 it was necessary to import into Korea 316,000 tons of coal and coke from Japan and 627,000 tons from other countries, chiefly China and Manchuria. It seems certain that Korea will never be able to send important quantities of coal to Japan.

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[1] Mining in Japan, *op. cit.*, p. 45.

[2] Coal Resources of the World, *op. cit.*

The Korean coal reserves, though small, are of good quality, about one-half being classified as anthracite and high grade bituminous. The principal mine is the Pyong-Yang colliery, owned and operated by the Japanese government. It is of especial importance as the only anthracite mine in Japanese territory. The colliery now has an annual capacity of about 300,000 tons. The greater part of the output is shipped to the briquet factory of the Imperial Navy at Tokuyama in southern Honshiu where it is made into a smokeless fuel for naval use.[1]

Nowhere in the Japanese Empire are coal and iron ore, the two essential bulk materials of modern industry, to be found in sufficient quantities to support any major manufacturing development. The iron and steel industry, if it must depend upon the resources of the Empire, can be only a weak thing propped up by subsidies and tariffs and capable of supplying only a small part of the domestic demands. Other manufacturing industries will ultimately begin to feel the constriction of the inadequate power resources as the coal reserves near exhaustion and the costs of mining mount higher. To find new sources of iron ore and of fuel, Japan is pushing far afield—to Manchuria, to China, and even to more distant lands. But as the circle of expansion grows wider, there arise the problems of transportation costs, of the control of the deposits, and of national security in the event of war.

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[1] Japan Year Book, *op. cit.*, p. 484, 1930.

CHAPTER XVII

MANCHURIA AS A SOURCE OF RAW MATERIALS

THE story of Japanese expansion in Manchuria is too well known to require more than the briefest summary. With the opening of the modern period, Japan began, almost immediately, to display an active interest in the mainland of Asia. A treaty of commerce was concluded with Korea in 1876, but China had claimed a considerable degree of political control over Korea for several centuries and resented the Japanese intrusion. The conflicting interests of Japan and China finally culminated in war in 1894. Japan was easily victorious. By the Treaty of Shimonoseki, signed in 1895, China agreed to recognize the complete independence of Korea, thus opening the way to Japanese penetration.

JAPANESE EXPANSION IN MANCHURIA

In the same treaty, Japan made the first move to gain a foothold in Manchuria by forcing China to cede to her the Liaotung Peninsula. But Japan was not permitted to enjoy this particular fruit of her victory, for under the pretext of preserving the sovereignty of China and safeguarding the peace of the Far East, Russia, France, and Germany insisted that the Manchurian territory should be restored to China. It was soon evident that the interest of the three powers was not entirely altruistic. France was continually extending her sphere of influence in south China, and in 1897, Germany began her advance in the Shantung Peninsula with the lease of Kiaochow Bay. Within 3 years of the signing of the Treaty of Shimonoseki, Russia had obtained from China a lease on the Liaotung Peninsula for a period of 25 years and a concession to construct a railway northward from Port Arthur and Talienwan to the Chinese Eastern Railway in northern Manchuria. The agreement struck directly at Japan's ambitions on the continent and may be considered the second step toward the Russo-Japanese War, the first being Russia's interference three years earlier at the conclusion of the Sino-Japanese War. A third and final step was the Russian advance in Korea.

War with Russia was declared in 1904 after Japan had concluded a defensive alliance with Great Britain. Again Japan was victorious. By the Treaty of Portsmouth, of September, 1905, terminating the

Russo-Japanese War, Russia agreed to transfer to Japan, "with the consent of China," the lease on the Liaotung Peninsula and also the railway between Port Arthur and Dalny (Dairen) and Chang-Chun together with the coal mines belonging to or worked by the railway and all rights and privileges enjoyed in the railway zone.[1] This railway is the present South Manchuria Railway. In December of the same year, a treaty was negotiated between China and Japan in which China gave the necessary consent to the transfer of the lease and concessions by Russia and also granted permission to Japan to convert the military railway that had been constructed during the Russo-Japanese War from Antung on the Korean border to Mukden into a standard commercial railway. This railway became a part of the line running through Korea from Fusan on the southern coast and connecting with the South Manchuria Railway at Mukden. China, in a secret protocol to the treaty of 1905, agreed not to build railways in Manchuria in competition with the Japanese lines. In 1907, and again in 1909, 1913, 1915 and 1918, China agreed to borrow from Japan a part of the capital required for the building of certain proposed railway lines in Manchuria and Mongolia and to give limited supervision over the lines to Japanese officials.[2] The effect of these agreements was to exclude non-Japanese capital from Manchuria and to strengthen Japanese control. Similar loan agreements have been made for the exploitation of gold mines and forest resources.

In the Sino-Japanese agreement of 1909, it was provided that the mines at Fushun and Yentai, Manchuria, might be worked by the Japanese government, Japan undertaking to respect the full sovereignty of China and to pay to the Chinese government a tax on all coals mined, the amount to be based upon the lowest tariff for coal produced in any other place in China. The agreement also provided that the lowest duty for exports from any other Chinese mines should be applied to coal exported from the Manchurian mines.

For the operation of the railway and for the exploitation of the rights in Manchuria obtained from Russia under the Treaty of Shimonoseki, Japan established a joint-stock company, the South Manchuria Railway Company, in which the government owns a percentage of the stock sufficient to assure to it permanent control. The first serious threat to the Japanese transportation monopoly in Manchuria came in 1909 with the proposal of the American Secretary of State to neutralize the Manchuria railways, an outgrowth of the plan of British and American banking interests to obtain from China the right to construct a railway parallel to the South Manchuria Railway, though some distance to the west, through Manchuria and Mongolia from Chinchau on the Peking-Mukden line to Tsitsihar on the Chinese Eastern. The proposal was opposed by both Japan and Russia and was not carried out.[1] More recently, with the rise of the Nationalist government, the Chinese have begun the construction of a number of railway lines in Manchuria, some of them, according to Japanese claims, in violation of the secret Sino-Japanese agreement of 1905 and of the later railway agreements.[2]

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[1] WILLOUGHBY, *op. cit.*

[2] *Op. cit.*

Despite the expansion of their political control in Manchuria, the Japanese government experienced increasing difficulty in persuading financiers, both in Japan and in foreign money markets, to advance funds for investment, since the original lease over the Liaotung Peninsula, concluded in 1898 between Russia and China, was to expire in 1923 and the concession over the railway zone in 1938. As a consequence of this uncertainty and hesitation, one of the Twenty-one Demands of 1915 provided that both leases should be amended to run for 99 years, the lease over Liaotung to expire in 1997 and the restoration of the South Manchuria Railway and the railway zone to China to occur in 2002.[3] The Twenty-one Demands also provided that all negotiations with reference to foreign loans in Manchuria and Inner Mongolia on security of taxes should be conducted first with Japanese capitalists and especially that Japan should have the right to supply the capital for the building of railways. Japan demanded the right to supply foreign advisers or instructors in South Manchuria and also the right for Japanese subject to prospect for minerals and to open mines in nine specified areas in Fengtien and Kirin Provinces of Manchuria in addition to the areas where minerals were already being exploited by the Japanese. One of these new areas was Anshan where the iron and steel plant of the South Manchuria Railway has since been constructed. The Chinese government, very much against its desires, was forced to accede to all of these demands and it is upon them that Japanese control in Manchuria is now based.

MANCHURIA AS A SOURCE OF FOOD

Japan's interest in Manchuria may be said to be threefold. The first great motivating force of her independent foreign policy was the fear of aggression from the mainland of Asia and the insistence that Korea was a spearhead thrust out from the continent and threatening her safety. For the attitude toward Korea, there is ample historical foundation. Prior to the Sino-Japanese War of 1895, all of the foreign wars of Japan had been with Korea, and it was from Korea that the ill-fated Mongol attack on Japan was launched by Kublai Khan in 1274. Toward the end of the nineteenth century and especially after the expansion of Russian power in Manchuria, the figure of speech was somewhat broadened and the spearhead was considered to include not only Korea but South Manchuria as well. The war with Russia secured the control of both areas to Japan and both are still considered an essential part of the Japanese defenses.

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[1] *Op. cit.*

[2] C. WALTER YOUNG, "Economic Bases for New Railways in Manchuria," *Chinese Economic Journal*, April, 1927, pp. 324–338; also WILLOUGHBY, *op. cit.*

[3] China's Official History of the Recent Sino-Japanese Treaties, also the Chino-Japanese Negotiations, Chinese Official Statement with Documents and Treaties and Annexures, Peking, 1915.

After the Russo-Japanese War, there was great enthusiasm in Japan, and high hopes were entertained that the new territory would serve as an outlet for the Japanese population, just as the American continents had absorbed colonists from the crowded lands of Europe during the seventeenth, eighteenth and nineteenth centuries. But as pointed out in earlier chapters, these hopes have never materialized. In all of Manchuria after more than 20 years of control, there are now not more than 240,000 Japanese. No one in Japan today has any illusions on the subject, and it is generally conceded that in population, at least, Manchuria will remain Chinese.

The more recent interest in Manchuria has been as a possible source of food for the rapidly increasing population of Japan and of raw materials for Japanese manufacturing industries. Manchuria is a rich agricultural region. There are vast stretches of level and gently rolling land, much of it as yet untouched. The soil is fertile and the climate resembles the climate of the section of the North American continent extending from the corn belt states of the United States into the prairie provinces of Canada. A greatly increased production of soy beans, rice, wheat, maize, sorghum, millet, and meat is possible. As the population becomes denser through the Chinese migrations, the local demand for food will undoubtedly become greater, but for many years to come there will be a surplus for export, and Japan can look to Manchuria for food products.

THE IRON ORE RESOURCES

Manchuria also has resources of the two materials, iron ore and coal, required for the Japanese iron and steel industry. Both minerals occur in a number of localities, but the important exploitation of the iron ore at present is at Anshan and at Miao-Erh-Kou, and of the coal at Fushun, Yentai, and Penhsihu. In estimated reserves, the iron ore resources of Manchuria appear to be large. They extend in a narrow zone of detached Archean deposits for a distance of 125 miles from the Korean border southwestward across Manchuria to the Liaotung Gulf and are apparently continued for another 235 miles under the sea and into northwestern Chihli Province. Tegengren has compared the deposits in extent to some of the large iron ore regions of North America, but there is little similarity either in the quality of the ore or in its economic value. The ore is both hematite and magnetite. The Manchurian deposits have been estimated to contain total reserves of about 1,000,000,000 tons with a metallic iron content of approximately 300,000,000 to 350,000,000 tons or, approximately, the metallic content of the ore reserves of Germany and of the United Kingdom and about one-seventh of the metallic content of the estimated reserves of the United States. The bulk of the ore is of very low grade containing from 45 to 55 per cent of silica[1] and only 30 to 35 per cent of iron. In any other country, much of this reserve would scarcely be considered as ore. As Bain states it, "in the Lake Superior region of the United States there are millions of tons of similar material not counted as ore."[2] If ore of the Manchurian grade were considered in estimating the reserves of the United States, Germany, and the United Kingdom, the totals for those countries would undoubtedly be increased many fold.

Scattered through the low grade ore in Manchuria, there are a number of small deposits containing 60 per cent or more of iron, but Tegengren estimates the total reserves of such ores at perhaps 10,000,000 tons, or not more than 1 per cent of the Manchurian total. It is the only ore comparable in quality to that used in the great industrial countries and the reserve is wholly inadequate as the basis of an iron and steel industry of any magnitude. If only this ore is considered, the Manchurian reserves are not more than 2.5 per cent of the reserves of Germany, less than 2 per cent of the reserves of the United Kingdom, and one-quarter of one per cent of the reserves of the United States. Germany and the United Kingdom, though both countries have much larger ore reserves of good quality than Manchuria, now find their own supplies to be inadequate and import ore for their iron and steel industries.

Not only is the quantity of the richer Manchurian ores limited, but they occur in pockets so situated that they cannot be exploited economically alone. Unless more extensive high grade deposits are discovered, the iron and steel industry of Manchuria must depend upon the utilization of the low grade ores and upon their successful treatment for concentration and for the removal of the silica. Technically, such treatment is possible, but it adds to the cost of production to such an extent that the resulting iron and steel must carry a serious handicap in competing with the products of raw ore of higher grade.

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[1] TEGENGREN, *op. cit.*, pp. 97–121.

[2] BAIN, *op. cit.*, p. 88.

The Penhsihu Iron Works

Because of the low grade of the Manchurian iron ore resources and the long haul from the deposits to the seaboard, it is not likely that the ore will ever be shipped to Japan in any considerable quantity. Even during recent years, when strenuous efforts have been made to find new supplies of iron ore for the blast furnaces of Japan Proper, due to the disturbances in China and the consequent interruption of supplies from that source, there have been only small shipments of ore from Manchuria. The exploitation of the Manchurian deposits will depend upon blast furnaces established in Manchuria. There are at present two modern iron plants, one owned by private interests and drawing ore from the Miao-Erh-Kou deposit, and the other, a subsidiary of the South Manchuria Railway, located on the Anshan deposit.

Mining was carried on many centuries ago in Manchuria by Koreans, but it was almost completely abolished by the Manchus who feared that the earth spirits or the spirits of their ancestors buried nearby might be disturbed. The discovery in 1911 of the Miao-Erh-Kou iron ore deposit, the first large iron ore mine to be worked in Manchuria by the Japanese, was in reality the rediscovery of a mine that had been worked many centuries earlier. The deposit is situated near the Nan-Feng station on the Mukden-Antung Railway about 60 miles southeast of Mukden. It is connected with Nan-Feng by a light railway. Wang has estimated that the deposit contains approximately 100,000,000 tons of ore, not more than 2,000,000 tons of which is of sufficiently high grade to be considered as ore at the present time.[1]

The Miao-Erh-Kou iron mine is operated by the Sino-Japanese Coal and Iron Joint Stock Company, Ltd., organized by the Okura interests of Japan. The same company operates the Penhsihu colliery, also located on the Mukden-Antung Railway about 35 miles from Mukden and 25 miles from Miao-Erh-Kou. Immediately at the conclusion of the Russo-Japanese War in 1905, Okura and Company sought permission to work the Penhsihu coal deposit. The Chinese government was opposed to any Japanese mining enterprises in south Manchuria and it was not until 1909 that the necessary mining permit was secured. It was finally agreed that the mining operations should be carried on by a joint Sino-Japanese company, the Penhsihu Coal Mining Company, Ltd., with a capital of $2,000,000 (Mexican) to be subscribed equally by the Japanese and Chinese. With the rediscovery of the Miao-Erh-Kou iron ore deposit in 1911, the coal mining company was reorganized as the Sino-Japanese Coal and Iron Joint Stock Company, Ltd., and the capital was increased first to $4,000,000 and later to

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[1] C. F. Wang, "Coal and Iron Deposits of the Penhsihu District, Manchuria," *Transactions of American Institute of Mining Engineers*, Vol. 59, p. 414.

$7,000,000 (Mexican). Though the company is still nominally Sino-Japanese, it would appear that Okura and Company had secured virtual control, for in 1916, they extended to Fengtien Province, in which the properties are located, a loan of 1,500,000 yen ($750,000) for which the province pledged as security all of its shares in the Penhsihu Iron Works, the shaft-head tax on the output of the Penhsihu colliery, the shaft-head tax and royalties of the Fushun collieries, and also all the shares owned by the province in the Antung Lumber Company.[1]

The reserve of the coal deposit at Penhsihu has been estimated at 190,000,000 tons of bituminous coal.[2] The mine is especially important, since it is one of the few large mines in China producing coal that will make a good metallurgical coke. The annual output of the mine is at present between 400,000 and 500,000 tons.

TABLE XVII.—OUTPUT OF PRINCIPAL COAL MINES, MANCHURIA
(Tons)

Year	Fushun[1]	Penhsihu[2]	Yentai[1]
1912	1,470,150	126,071	43,104
1913	2,185,453	270,922	95,300
1914	2,147,432	298,793	96,815
1915	2,169,245	275,778	71,026
1916	2,039,578	322,635	91,645
1917	2,275,905	438,009	113,679
1918	2,601,849	363,720	104,947
1919	2,928,792	393,782	110,167
1920	3,129,835	409,751	79,548
1921	2,738,416	338,000	50,050
1922	3,784,200	285,000	63,098
1923	4,883,000	373,000	98,000
1924	5,504,300	448,552	104,200
1925	5,681,680	424,462	117,700
1926	6,414,060	405,337	131,325
1927	6,839,870	402,905	143,000
1928	7,198,000	462,327	155,000

[1] 1912–1917, Bank of Chosen, Economic History of Manchuria, p. 167; 1918–1924, C. Y. HSIEH, *op. cit.;* 1925–1928, New York Office of South Manchuria Railway Company.

[2] 1912–1916, Economic History of Manchuria, *op. cit.;* 1917, V. K. TING and W. H. WONG, General Statement of the Mining Industry, Special Report No. 1, Geological Survey of China, June, 1921, p. 18; 1918–1924, C. Y. HSIEH, *op. cit.;* 1925–1928, New York Office of Okura and Company.

To utilize the iron ore of the Miao-Erh-Kou deposit, a blast furnace of 130-ton capacity was completed at the Penhsihu coal mine in 1915 and a second furnace of the same size was completed in 1918. During the war boom, two small 20-ton furnaces were constructed. They are no longer in use. Coke, high in ash and also in sulphur, is produced at the mines by very primitive methods in open mounds. Limestone is quarried near the furnaces. The iron ore is transported by rail the 25 miles from the Miao-Erh-Kou mine, and a small amount is brought in from Korea.[1] There is no steel plant connected with the blast furnaces, and practically all of the pig iron is shipped to Japan through the port of Yingkou on the Gulf of Liaotung after a rail haul of about 140 miles by way of Mukden. The output of pig iron has been very irregular and, since 1918, has ranged from 24,000 to 79,000 tons per year (see Tables XVII and XVIII). With the present capacity of the Penhsihu plant, the reserve of high grade ore at the Miao-Erh-Kou mine will be exhausted before 1935, and it will be necessary to perfect a method of utilizing the low grade ores.

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[1] TEGENGREN, *op. cit.*, p. 386; MACMURRAY, *op. cit.*, p. 1335.

[2] C. Y. HSIEH, General Statement on the Mining Industry, 1918–1925, Special Report, No. 2, Geological Survey of China, December, 1926.

TABLE XVIII.—PRODUCTION OF PIG IRON, MANCHURIA
(Tons)

Year	Penhsihu Works[1]	Anshan Works[2]	Total
1915	29,530		
1916	49,231		
1917	37,971		
1918	44,992		
1919	78,871		
1920	48,824	31,620	80,444
1921	30,070	75,273	105,343
1922	No operation	57,184	57,184
1923	24,338	66,543	90,881
1924	51,950	95,999	147,949
1925	50,000	89,676	139,676
1926	51,000	165,054	216,054
1927	50,500	203,445	253,945
1928	63,030	213,000	276,030

[1] 1915–1922, TEGENGREN, *op. cit.*, p. 399; 1923, *Chinese Economic Journal*, Peking, April, 1929, p. 297; 1924–1928, New York Office of Okura and Company.

[2] 1920–1923, Report on Progress in Manchuria, 1907–1928, *op. cit.*, p. 90; 1924–1928, New York Office of South Manchuria Railway Company. Data on Anshan Works are for fiscal years ending Mar. 31, 1920–1923.

The Anshan Iron Works

Representatives of the Geological Institute of the South Manchuria Railway Company discovered iron ore in 1909 at Anshan about 50 miles south of Mukden on the main line of the South Manchuria Railway to Dairen and Port Arthur. By one of the articles of the Twenty-one Demands of 1915, Japan secured for her subjects the right to open mines in nine specified localities in Manchuria, one of which was Anshan. The Anshan deposit has been estimated to contain 400,000,000 tons of iron ore, but the bulk of it is like most Manchurian ore, high in silica and low in iron content. Tegengren is of the opinion that the high grade ore available by open cut mining does not exceed 2,000,000 tons, but it is possible that additional reserves will be discovered through prospecting at greater depths with diamond drills.[1]

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[1] TEGENGREN, *op. cit.*, p. 386.

For the working of the Anshan mines, a Sino-Japanese company, Chen-Hsing-Kung-Ssu, was organized under the South Manchuria Railway Company in 1917 and the construction of an iron smelting plant was begun. It was located at Anshan at the iron ore though the more usual procedure, when the iron ore and fuel do not occur together, is to locate the iron and steel industry at the source of fuel. In determining the location of the plant, the deciding consideration was undoubtedly the position of the iron ore some 75 miles nearer to the exporting ports than is the Fushun coal mine of the South Manchuria Railway from which it was then expected that the fuel would be obtained.

The first blast furnace was put into operation in 1919 and the second in 1920. Each furnace had a daily capacity of 250 tons of pig iron, later increased to 300 tons, or a combined annual capacity of about 200,000 tons. There is no steel plant in Manchuria, and most of the pig is now exported to Japan. Announcement was made in 1928 of a plan to increase the capacity of the Anshan plant to 400,000 tons of pig iron a year through the erection of a new 500-ton furnace. According to this plan, 160,000 tons of the annual output of pig are to be exported to Japan and the remainder is to be made into steel bars, billets, wire rod, black sheet plates, and other finished products in a new steel plant to be known as the Showa Steel Manufacturing Company. An official of the railway is reported to have purchased equipment for the new plant to the value of about $4,000,000 (gold) from the Krupp Works in Germany in 1928.[2]

For some time, there has been a controversy with regard to the site of the proposed Showa plant. The officials of the South Manchuria Railway have insisted that it should be located at Anshan, but they have been unwilling to proceed with its construction without the assurance of heavy subsidies from the Japanese government and the exemption of its products from the Japanese import duties. The Ministry of Finance of the Imperial Cabinet has refused to give such assurance or to sanction any changes in the Japanese tariff policy and contends that a preferable location for the new plant would be at Shingishu, Korea, near the mouth of the Yalu River and on the railway from Mukden to Korea. The natural advantages of the Korean location are not entirely evident. The steel plant of the Mitsubishi Company at

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[1] TEGENGREN, *op. cit.*, p. 118.

[2] *Trans-Pacific*, *op. cit.*, July 11 and 18, 1929; Jan. 23, 1930.

Kenjiho, Korea, near iron ore, has been a failure and has closed down, and the iron plant of the same company has not been very profitable. There is less likelihood of a steel plant at Shingishu succeeding, for there is no coal or iron ore immediately at hand. If pig iron from the Anshan furnaces is to be used, it must be transported a distance of some 200 miles by rail. It may be the plan of the Ministry of Finance to bring together at Shingishu the iron ore and pig iron of Korea and the coking coal of Manchuria. The principal Korean iron ore deposits and the Kenjiho plant of the Mitsubishi Company are located about 180 miles to the southeast and the Penhsihu colliery is about the same distance to the northwest in Manchuria.

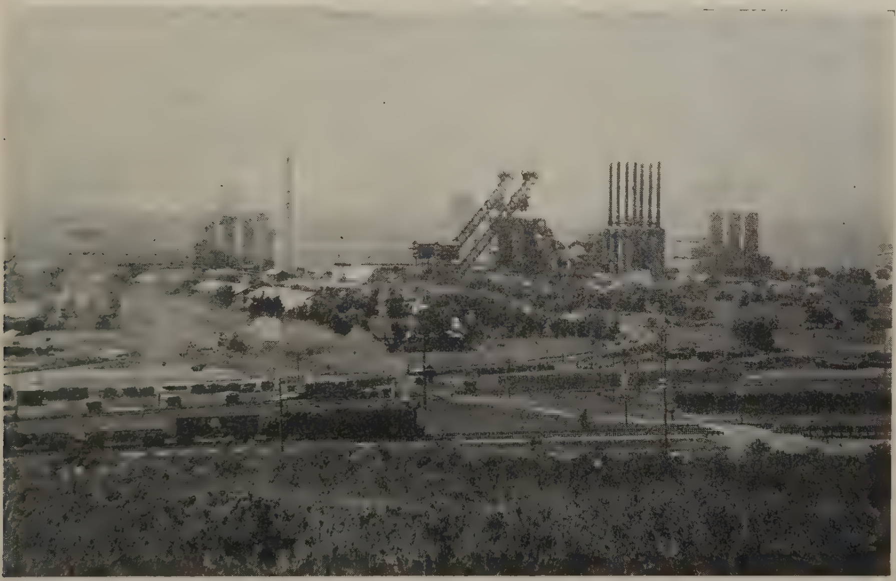

FIG. 107.—The Anshan Iron Works in Manchuria. (*Courtesy of the South Manchuria Railway Co.*)

Other considerations have undoubtedly had much greater weight than geographic conditions in determining the position taken by the Ministry. Its insistence upon the Korean site has been dictated by a desire to take advantage of the fact that products from Korea are admitted to Japan free of duty while Manchurian products must pay a high ad valorem duty, and the Finance Minister has stated that there can be no change in that policy. A steel plant established in Korea would receive on its output the benefit of subsidies already provided for in the present law for the encouragement of the Japanese steel industry. It seems probable, also, that the consideration of the Korean site is partly political and was inspired by the rising tide of nationalism in China, since at about the time that Shingishu was first proposed as the site of the new plant, China was engaged in an effort to oust Russia from northern Manchuria, and the Japanese government may have been reluctant to give support to so important an enterprise established upon soil not firmly under Japanese control. The Finance Minister has pointed out that Anshan is in a foreign land and that his ministry is unwilling to subsidize enterprises outside of Japanese territory. The controversy still rages, but at the present writing the consensus of opinion in Japan seems to be that the Korean site will be abandoned and that the new plant will be located at Anshan.[1]

The proposal to locate the new steel plant in Manchuria or in Korea would appear to be an acknowledgment on the part of the Japanese government that the future of the primary steel industry in Japan Proper is not promising. Otherwise, the efforts of the government would be concentrated upon the expansion of the industry in Japan where it could be more easily controlled in the event of war and where it would employ Japanese workers. If the Manchurian plant is established and is able to operate economically, it will make even more precarious than at present the position of the Japanese steel plants, handicapped as they are by deficient raw materials and high costs of production. The Japanese government is either prepared to give further protection and assistance to the primary steel industry of Japan Proper or it is willing to risk its decline for the sake of a larger steel industry under its control though not in the home islands.

To get the benefit of the Japanese subsidy on finished steel, the South Manchuria Railway has under consideration plans for the construction of a plant in Japan Proper for the manufacture of finished steel products from the semimanufactured iron and steel from Anshan and from the proposed steel plant, wherever it may be located. One site that has been suggested for the fabricating plant is at Tsurumi near Yokohama.[2]

The Anshan iron plant in its brief history has experienced many difficulties. The original plans provided for eight blast furnaces and a steel plant capable of turning out 800,000 tons of steel a year. They were plans, however, formulated during the World War boom when the iron and steel industry even in Japan was highly profitable. With the postwar depression, construction was halted after the completion of the two blast furnaces. In anticipation of the finished plant, however, a model town to accommodate 10,000 people had been laid out and much equipment not required for the reduced plant had been

[1] *Trans-Pacific, op. cit.*, Mar. 27, 1930, p. 20; July 3, 1930, p. 18; July 24, 1930, p. 18.
[2] *Trans-Pacific, op. cit.*, Apr. 11, 1929.

installed. It is stated that the Anshan works and the auxiliary construction have cost from $20,000,000 to $30,000,000 gold.[1]

As a going concern, the Anshan plant has not been a success. An American engineer, after a visit to the plant a few years ago, stated that "as the plant stands today it is a failure not only financially but metallurgically," and he further described it as the most pathetic sight in the iron world because of the faulty judgment of the engineers and geologists that had permitted the expenditure of $30,000,000 in its construction. Hoyt, in his investigation in 1922, was unable to obtain any complete data on costs of production, but the manager of the plant stated that including only raw materials, fuel, and labor but not including interest, town expenses, depreciation, relining of furnaces and ore concentration, the pig iron was being produced at a cost of $35 per ton. This was at a time when Bessemer pig iron was selling in Pittsburgh at $29 per ton, and basic pig at $25.80.

TABLE XIX.—FINANCIAL REPORT OF ANSHAN IRON WORKS[1]

Fiscal year	Income, yen[2]	Expenditures, yen	Loss, yen	Gain, yen
1919–1920	2,796,224	4,283,392	1,487,168	
1920–1921	1,580,655	8,003,233	6,422,577	
1921–1922	3,606,999	6,480,725	2,873,726	
1922–1923	3,386,935	6,585,278	3,198,343	
1923–1924	3,703,690	5,944,588	2,240,897	
1924–1925	4,430,753	7,386,361	2,955,607	
1925–1926	3,986,931	7,706,920	3,719,989	
1926–1927	6,896,504	10,703,098	3,806,594	
1927–1928	9,223,114	9,380,656	157,542	
1928–1929	9,740,000	8,520,000	....	1,220,000

[1] Report on Progress in Manchuria, 1907–1928, *op. cit.*, p. 90. Data for 1928–1929 from *Trans-Pacific*, *op. cit.*, May 30, 1929.

[2] Par value of yen is $0.4984.

Though the output has increased since 1922 and production costs have been reduced, the plant has been operated at a very large loss as is shown in Table XIX. In the eight-year period ending with the fiscal year 1926–1927, the annual losses ranged from 1,500,000 yen ($750,000) to 6,400,000 yen ($3,200,000). In 1927–1928, there was a substantial reduction in the deficit and in 1928–1929 there was a profit for the first time, the income exceeding the expenditures by a little over $600,000. For the 10-year period from 1919 to 1929, the net loss of the plant has totaled a little over $12,000,000.

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[1] TEGENGREN, *op. cit.*, p. 390; U. S. Bureau of Foreign and Domestic Commerce, Anshan Iron and Steel Works, Manchuria, unpublished report No. 7187, LANSING W. HOYT, Jan. 24, 1923.

The South Manchuria Railway is a large company with many interests and with access to the public treasury through its semi-government character. It is well able to carry the losses of the Anshan works by drawing on the profits of its other enterprises, especially the railway and the coal mines.[1] It is hoped that in the future it will be possible to operate the plant without loss, but there seems to be no expectation of repaying the cost of its construction. In fact, the plant has recently been reappraised at 50 per cent of its original cost, this reduction in capital and interest charges being in part responsible for the profits of the last fiscal year.[2] The plant is regarded as a necessary national investment to provide a basic industry essential both for defense and for the development of manufacturing.

The high costs and the operating losses have been due to a number of technical difficulties. In an effort to overcome serious operation troubles, it was necessary to rebuild Number 1 furnace from hearth to charging platform in 1922 after it had been in use less than four years. Another added expense was the construction of an elaborate waterworks, made necessary by the fact that the rainfall of Manchuria is light and highly seasonal and the rivers are almost dry during eight or nine months of the year. In the iron and steel industry, a tremendous amount of water is required. More serious, perhaps, because they have not been completely solved have been three other difficulties—the quality of the iron ore, the quality of the fuel, and the distance that the finished product must be carried to market.

The plant seems to have been constructed without any very careful examination of the available raw materials—the iron ore, the limestone, and the fuel.[3] No limestone is available in the vicinity of the Anshan plant and the supplies required for the blast furnaces must be carried 85 miles by rail from Penhsihu.

The supply of iron ore at hand is large, but the bulk of it is of low grade. When the plant first began operation, an attempt was made to use this ore, but the pig iron produced was so high in silicon that it was not saleable. Hoyt has stated that at the time of his visit, the one furnace in operation was producing about 120 tons of pig iron per day containing 3 per cent of silicon, an amount that made it useless for the making of steel in the open-hearth furnace.[4] With the failure of the low grade ore, only the pockets of high grade ore were worked for a time. Since the ore was mined near the furnaces, there was no charge for transportation and ore costs per ton of pig iron were materially below the costs at the Pittsburgh furnaces which are dependent upon the distant Lake Superior deposits.[1] It was realized, however, that the reserve of high grade ore was entirely inadequate and that some method of utilizing the low grade ores would have to be perfected if the plant was to be successful. A great deal of money has been expended in experimentation and, with the assistance of Dr. Gröndal, the Swedish metallurgist, and a number of American experts, a method of concentration through roasting and magnetic separation has finally been worked out that produces a sinter with 60 per cent iron content. Such a process is technically possible, but it adds materially to production costs. No estimates of the costs of the concentrated ore are available, and it remains to be seen whether a plant where such treatment is necessary can meet the free competition of plants utilizing the raw ore. If the process is successful both technically and economically, it will be of the greatest importance to Japan, for it will provide a source of relatively cheap pig iron limited only by the reserves of ore. If, on the other hand, the process proves to be costly, the operation of the Anshan plant will probably continue with financial assistance from the South Manchuria Railway and the Japanese government, but Japanese industry will be handicapped by the higher costs of its iron and steel materials. As is indicated by Tables XVIII and XX, the output of iron ore and pig at Anshan has increased substantially in the last few years, probably as a result of the progress that is being made with the concentration process.

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[1] Report on Progress in Manchuria, *op. cit.*, p. 73.

[2] *Trans-Pacific*, *op. cit.*, May 9, 1929.

[3] TEGENGREN, *op. cit.*, p. 390.

[4] The Anshan Iron and Steel Works, *op. cit.*

TABLE XX.—OUTPUT OF PRINCIPAL IRON ORE MINES, MANCHURIA
(Tons)

Year	Miao-Erh-Kou[1]	Anshan[2]	Total
1915	51,001		
1916	71,353		
1917	98,146		
1918	89,251	88,364	177,615
1919	106,406	170,000	276,406
1920	105,239	155,000	260,239
1921	67,435	161,000	228,435
1922	No production	143,364	143,364
1923	25,513	188,218	213,731
1924	65,000	155,105	220,105
1925	65,000	157,996	222,996
1926	70,000	306,590	376,590
1927	70,000	371,000	441,000
1928	106,000	395,000	501,000

[1] 1915–1922, TEGENGREN, *op. cit.;* 1923–1924, *Chinese Economic Journal, op. cit.*, April, 1929; 1925–1928, New York Office of Okura and Company.

[2] 1918–1924, *Chinese Economic Journal, op. cit.;* 1925–1928, New York Office of the South Manchuria Railway Company.

[1] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 20.

The Fushun Colliery

The Anshan Iron Works was located at the iron ore and it was expected that the coal from the huge deposit at Fushun, operated by the South Manchuria Railway, would be used as fuel. It was later discovered, however, that the Fushun coal does not produce a satisfactory metallurgical coke and it is necessary to obtain coal from the Penhsihu colliery to mix with the Fushun coal in the proportion of 80 per cent Fushun coal and 20 per cent Penhsihu coal. The coke produced is apparently cheaper than that used in any of the furnaces of Japan Proper, but its cost is still about 25 per cent higher than the coke costs at the Pittsburgh furnaces.[1] Hoyt states that "Manchurian coke is high in ash (16 per cent) and moisture (10 per cent) and is none too good for the work in hand."[2] It would not be possible to transport such coke economically any distance. According to Ehlers, the Fushun coal will not coke, even when it is mixed with Penhsihu coal, if it is allowed to stand for any length of time after mining. It must be taken immediately from the mines to the coke ovens.[3] Efforts are being made to discover supplies of coking coal in the Fushun deposit so that it will no longer be necessary to use the Penhsihu coal, since that colliery is not owned by the South Manchuria Railway. It has also been reported that the Penhsihu colliery is to be absorbed by the South Manchuria Railway, but the rumor has been declared to be unfounded.[4]

The Fushun coal mine is located east of Mukden on a branch of the South Manchuria Railway and about 75 miles by rail from the Anshan Iron Works. The coal deposits are believed to have been discovered by Koreans about 700 years ago. Under Manchu rule, mining was stopped, and it was not resumed until the Russians entered Manchuria toward the end of the nineteenth century. Their operations were on a very limited scale, and the output did not exceed 130,000 tons a year. The coal deposit was transferred to the Japanese in 1905 as one of the rights of the South Manchuria Railway. Modern methods of mining were introduced, and the output is now between 7,000,000 and 8,000,000 tons a year (see Table XVII). Production costs are reported to be very low. Several shafts have been sunk, but the output is mainly from open pits, the Fushun mine being the largest open-cut mine in the world. The reserves of the Fushun deposit have been estimated at 839,000,000 tons.[5] The coal is of good quality for steam purposes and for gas making, but it does not coke. The Fushun coal is consumed mainly by the South Manchuria Railway and the Anshan Iron Works and by other industries in Manchuria. An effort is being made to increase its use by the Chinese as a domestic fuel. For the transport of the coal to the seaboard, the South Manchuria Railway has been double tracked from Mukden to Dairen. In the fiscal year 1927–1928, the South Manchuria Railway Company disposed of 7,400,000 tons of coal, practically all of which came from the Fushun collieries. Of this total, 1,300,000 tons were consumed on the railway and by the Anshan works; 2,000,000 tons went to other industries and to households in Manchuria; 700,000 tons were supplied to steamers as bunker coal; and 3,400,000 tons were exported, about one-half to Japan Proper and the remainder to China, Korea, and the South Seas.[1] The shipments from Manchuria to Japan have been restricted upon the insistence of the Coal Mining Association of Japan due to the overproduction of the Kyushu mines. The South Manchuria Railway agreed to reduce the exports of Fushun coal to Japan by 5 per cent in 1928. For 1929, a very small increase was permitted.[2]

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[1] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 20.
[2] The Anshan Iron and Steel Works, *op. cit.*
[3] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 15.
[4] *Trans-Pacific*, *op. cit.*, June 6, 1929.
[5] C. Y. Hsieh, *op. cit.*

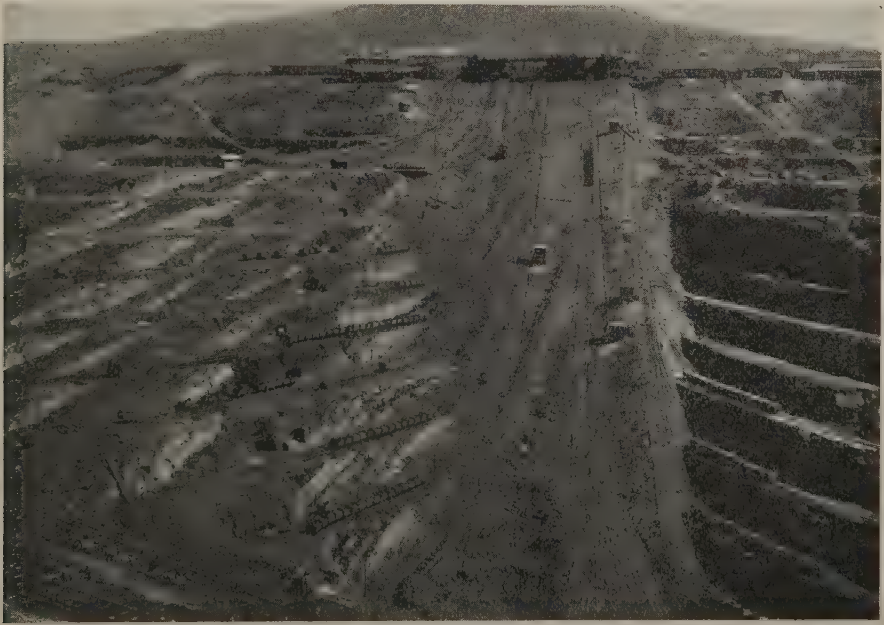

FIG. 108.—The Fushun colliery is the largest open cut coal mine in the world. (*Courtesy of the South Manchuria Railway Company.*)

One error of judgment in the original development plans at Fushun has added somewhat to operating costs. When the Japanese took over the property from the Russians, they began the construction of a city of about 40,000 population. It has since been discovered that the largest coal vein runs beneath the city, and that it is near enough to the surface to be mined by open cuts. The city is now being moved to a new site about 3 miles distant.[1]

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[1] Report on Progress in Manchuria, *op. cit.*, p. 87.

[2] Mitsubishi *Monthly Circular*, *op. cit.*, November, 1928, p. 17; January, 1929, p. 16.

The Marketing of Anshan Pig Iron

To return to the Anshan Iron Works, the third difficulty that has been experienced has been the transportation of the finished product to market. Most of the pig iron—72 per cent in 1927—is shipped to Japan, a distance of approximately 900 miles by rail and water. The remainder is used by the blacksmiths and other small iron-working shops in Manchuria. According to Ehlers, the transportation charges on pig iron from Manchuria to Japan are about 9 yen ($4.50) per ton. Since the Anshan works are located in Chinese territory, the product is also subject to an export tax of 2 yen per ton and to an import duty into Japan of 1.66 yen. Other charges bring the total to 14.16 yen ($7.08) per ton.[2]

The cost of transportation in itself need not be a serious handicap, for the distance from the Manchurian blast furnaces to the consuming markets is not especially great. It certainly has not been a major reason for the unsatisfactory development of the Manchurian industry. India, the principal foreign source of pig iron for Japan, is situated over 5,000 miles away, and yet the importation of Indian pig continues to increase. The cost of carrying the Manchurian pig to Japan becomes a serious consideration only if it must be added to furnace costs that are also high, and apparently Manchurian production costs are high though no complete or comparable cost data are available. The reported costs of flux and fuel and iron ore, at least of the high grade ore that does not require concentration, would indicate that the costs of the raw materials at the furnace are actually lower than in the United States,[3] but to the raw material costs must be added the labor costs, depreciation charges on the plant, interest charges on the investment, the cost of upkeep, and the general overhead for operation and management. It has been impossible to secure any information on these additional items, but from indirect evidence they would appear to be relatively high. The Manchurian plants, especially the Anshan works, have operated at a very large loss and they have never produced up to capacity despite the steady increase in the imports into Japan of British Indian pig iron. In 1929, about 60 per cent of the Japanese imports of pig, by value, came from British India, and the Indian imports were over 77 per cent greater than the imports from Manchuria.[1] Even with its very long journey, the import value of the Indian pig, that is the value at the port of unloading, is consistently from $2 to $3 (gold) per ton under the value of the Manchurian pig.[2]

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[1] *New York Times*, May 19, 1929.

[2] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, pp. 20–21.

[3] *Op. cit.*, p. 20.

Other Iron Ore and Coal Resources

There is a third deposit of iron ore in Manchuria located in the Kung-Ch'ang-Ling region, not far from Anshan. N. Ida, a Japanese subject, made an agreement with the authorities of Fengtien Province in 1916 for the working of the field under joint Sino-Japanese management, and in 1919 a company, known as the Kung-Ch'ang-Ling Iron Mining Company, was organized with a capital of $500,000 of which the Japanese subscribed 60 per cent and the provincial government 40 per cent. A concession was granted to the company by the Peking government in 1921. It was the plan of the company to ship the entire output of the mine to Japan, but so far mining operations have not begun, and under such a plan it is not likely that they will in the near future. Though the reserve is large, being conservatively estimated at 268,000,000 tons, the deposit does not differ from the other Manchurian deposits. The bulk of the ore is of low grade with less than 35 per cent iron content and as high as 50 per cent silica.[3] Such ore would probably not warrant the cost of transport to Japan.

The South Manchurian Railway operates the Yentai colliery about 50 miles south of Mukden. The reserves are small and the output is about 150,000 tons annually. The coal is apparently not of coking quality and is for that reason of no significance to the iron and steel industry.

OTHER RAW MATERIAL INDUSTRIES

The South Manchuria Railway has elaborate plans for the development of other industries in Manchuria based upon the coal resources. A plant for the distillation of oil from shale has been constructed at Fushun, and the beginning of capacity operation was announced in June, 1930.[4] There are apparently very large deposits of oil shale associated with the Fushun coal and the supply of fuel for the distillation process is ample. The plant has an annual capacity of 70,000 tons of crude oil and 7,000 tons of crude paraffin.[5] Oil shale undoubtedly constitutes a very important resource for the future oil supply of the world, but up to the present, though the distillation of the shale is technically possible, the product has been more expensive than the crude oil from wells. Perhaps the most important development of the oil shale industry has been in the Scottish Lowland, but the plants are so constructed that they distill the shale only when the price of petroleum is high. When the price declines, they turn to the refining of imported crude oils. Even if the Manchurian plant is economically successful and is able to operate up to full capacity, its output will be of small significance to Japan, for in 1928 the Japanese consumption of crude oil was about 1,000,000 tons, two-thirds of which was imported.[1]

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[1] Mitsubishi *Monthly Circular*, *op. cit.*, February, 1930.

[2] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1927.

[3] TEGENGREN, *op. cit.*, p. 111.

[4] *Trans-Pacific*, *op. cit.*, July 10, 1930.

[5] Report on Progress in Manchuria, *op. cit.*, p. 88.

The president of the South Manchuria Railway has also announced plans for the building of a soda ash plant and a plant to produce nitrogen fertilizer from the gases at the Anshan Iron Works. Due to the change in the Japanese Cabinet in July, 1929, and the retrenchment policy of the new government, the execution of these plans has been halted.

SUMMARY

Manchuria is a rich land and an important potential source of food and raw materials, but its wealth is by no means sufficient to meet all of the needs of Japan. The agricultural possibilities of the region are its greatest resource. Manchuria can supply food and vegetable oils. The cultivation of cotton can be increased though the production will probably never be sufficient to meet the demands of the Japanese cotton industry. There is an abundance of timber, especially along the eastern borders.

Food, cotton, and timber are important requirements for Japan, but her most pressing need is an adequate and dependable supply of minerals, especially coal and iron ore. Manchuria has coal. It will undoubtedly promote the building of railways and contribute materially to the development of a variety of manufacturing industries along the South Manchuria line. Some of the output will be shipped to Japan, but the Manchurian coal resources will not solve the fuel deficiencies of Japan Proper, for though the Japanese reserves are small, the Manchurian reserves are even smaller. The coal deposits of that part of Manchuria under Japanese influence are estimated to contain less than 1,500,000,000 tons.[2] They constitute over half of the reserves of all of Manchuria. The coal reserves of Japan Proper total a little over 7,000,000,000 tons. Japan lacks coking coal, and only a small part of the Manchurian coal will make a satisfactory metallurgical coke.

[1] *Op. cit.*, also Mitsubishi *Monthly Circular*, *op. cit.*, October, 1929, p. 11.

[2] C. Y. Hsieh, *op. cit.*

Japan has practically no iron ore. Manchuria has reserves fairly large in total quantity but very poor in quality. Because of their low grade, the Manchurian ores cannot be shipped to Japan, and their continued use in the Manchurian furnaces to supply pig iron to Japan rests upon the perfection of a concentration process successful both technically and economically.

A consideration even more vital than the quality and quantity of the Manchurian mineral resources is the fact that they are located on alien territory. There has been no transfer of sovereignty from China to Japan. Japan controls the Liaotung Peninsula, a very small area on the coast important chiefly as a commercial outlet for Manchuria, on a lease that expires at the end of the present century. She operates the South Manchuria Railway on a concession of similar duration. The remainder of Manchuria is under Chinese administration though Japan claims some police powers. The agricultural and mineral wealth of Manchuria is not located in the Liaotung Peninsula, and only to a very limited extent is it in the railway zone. Commodities shipped from Manchuria to Japan are treated exactly as though they had originated in a foreign country and must pay all import duties. If Japan should succeed in developing Manchuria into a significant source of raw materials, the Japanese manufacturing industries would rest upon a most precarious foundation, for the continuation of the supply of materials would depend upon the acquiescence of China and would be subject to interruption at every civil disturbance. The security of Japanese industry could be assured only with the occupation of Manchuria by Japan and the annexation of the territory as a part of the Empire, a step that would be attended inevitably with many difficulties in view of the growing self-assertion of China, the rapid settlement of Manchuria by Chinese peasants, and the certain opposition of the other world powers.

It is evident that Japan, either because of recognized deficiencies in the resources or because of political uncertainties, no longer looks to Manchuria for the solution of the urgent problems of her industrialization program. The effort to secure control of mineral resources in other parts of China proceeds and the search is extending to more distant lands bordering the Pacific.

Chapter XVIII

CHINA AS A SOURCE OF IRON ORE AND FUEL

THAT China possesses a tremendous wealth of coal and iron ore is a belief generally accepted in western countries. It originated mainly with the writings of the German geologist, F. von Richthofen, who visited China in 1870 and who based his conclusions regarding the mineral wealth upon a survey necessarily superficial. It persists despite the efforts of more recent investigators to dispel it, or at least to modify it. It has become one of the postulates upon which the various jingo writers have based their bogy of the Yellow Peril. They claim to see in the possible combination of Chinese material wealth and Japanese enterprise a military and industrial threat to the West.

Japan has shared to a considerable degree the belief in China's mineral wealth and has made strenuous efforts to secure control of supplies of raw materials for her iron and steel industry. The Japanese penetration into Manchuria has been reviewed in the previous chapter. In the parts of China not under Japanese political influence, Japanese commercial interests, always with the active support and assistance of the Japanese government, have sought and gained control of a number of mining properties, including the Hanyehp'ing Company with its coal and iron mines on and near the Yangtze River and its blast furnaces at Hanyang and Tayeh. Both iron ore and pig iron have been shipped to Japan, but as a basis for Japanese industrialization, these enterprises have been disappointing. They have been opposed persistently by the Chinese, the movement of materials has been hampered and even halted by the civil wars, and it has been discovered, with exploitation, that the Chinese wealth in minerals, especially iron ore, has been exaggerated and that the minerals themselves are expensive to mine and transport.

COAL RESOURCES

It is possible here to present only a general survey of the mineral resources of China with a more detailed examination of those deposits in which Japan has an especial interest. China possesses large reserves of coal. Various estimates of the total tonnage have been made ranging from a minimum estimate of 23,000,000,000 tons by W. H. Wong, Director of the Geological Survey of China,[1] to a maximum of 996,000,000,000 tons by N. F. Drake, an American mining engineer.[2] Bain is of the opinion that Drake's total for the country may be accepted

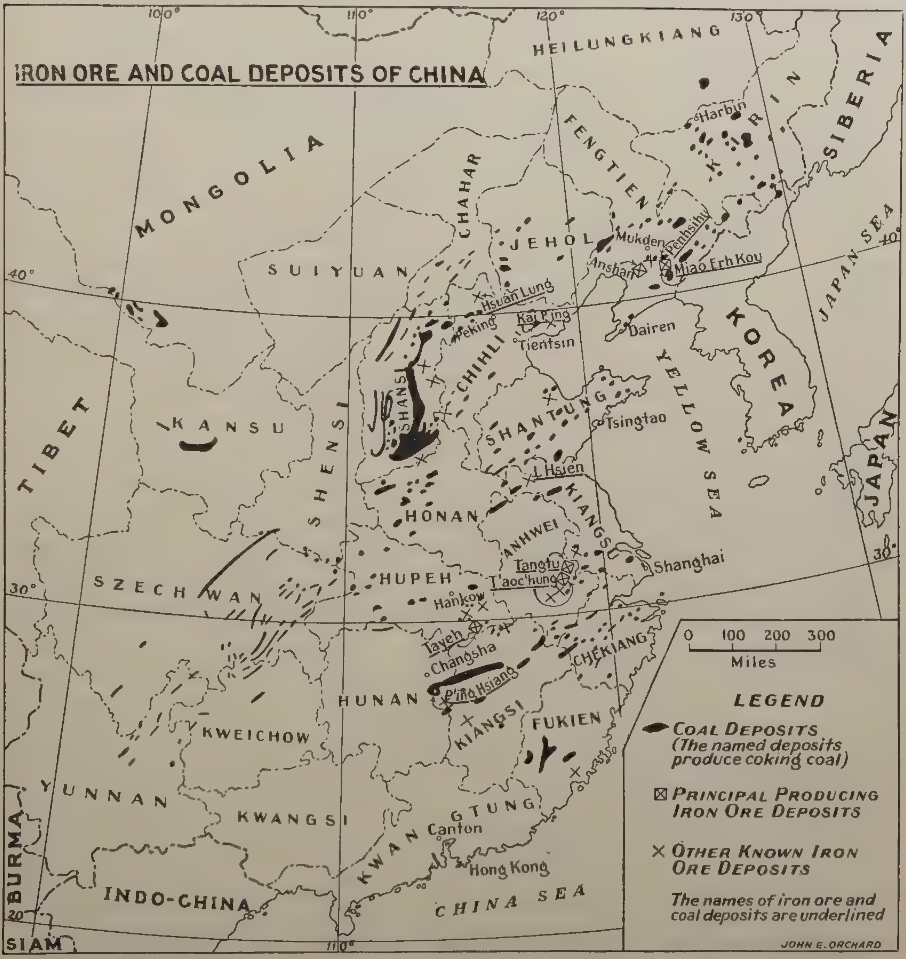
IRON ORE AND COAL DEPOSITS OF CHINA
100°
110°
120°
130°
40°
30°
20°
HEILUNGKIANG
KIRIN
SIBERIA
Harbin
FENGTIEN
MONGOLIA
CHAHAR
JEHOL
Mukden
Penhsihu
Anshan
Miao Erh Kou
JAPAN SEA
SUIYUAN
Hsuan Lung
Kai Ping
Peking
Tientsin
Dairen
KOREA
TIBET
KANSU
SHENSI
SHANSI
CHIHLI
SHANTUNG
Tsingtao
YELLOW SEA
JAPAN
I Hsien
HONAN
KIANGSU
ANHWEI
Tangtu
T'aoc'hung
Shanghai
SZECHWAN
HUPEH
Hankow
Tayeh
Changsha
P'ing Hsiang
CHEKIANG
HUNAN
KIANGSI
FUKIEN
KWEICHOW
YUNNAN
KWANGSI
KWANGTUNG
Canton
Hong Kong
BURMA
INDO-CHINA
SIAM
CHINA SEA
0 100 200 300
Miles
LEGEND
▬ Coal Deposits (The named deposits produce coking coal)
☒ Principal Producing Iron Ore Deposits
× Other Known Iron Ore Deposits
The names of iron ore and coal deposits are underlined
JOHN E. ORCHARD

FIG. 109.—China has rich coal deposits well distributed throughout the country. There is little coking coal. The iron ore reserves suitable for modern blast furnaces are limited to a few localities.[3]

as of the right order though revision of his estimates for certain localities may be necessary.[4]

The reserves are distributed throughout China as is evident from an examination of Figure 109. Every one of the 18 provinces of China

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[1] China Year Book, 1924, p. 124.

[2] Coal Resources of the World, *op. cit.*

[3] Based on data from Tegengren, *op. cit.*, and Coal Resources of the World, *op. cit.*

[4] BAIN, *op. cit.*, p. 50.

Proper has some coal, but the most extensive field, one of the richest in the world, lies in the northern province of Shansi with extensions into the neighboring provinces of Chihli, Shantung, Honan, Shensi, and Kansu. There is another large field south of the Yangtze River in Hunan, Kweichow, and Kiangsi, and a third in Yunnan and Szechwan far to the west on the borders of Tibet.

China appears to have one of the largest reserves of coal of any country of the world, ranking with the United States and Canada and far above such important coal producers as Great Britain and Germany. Even with the very dense population of the country, the per capita reserves of China are moderately large, as is indicated by Figure 103. The quality of the coal is high and in the estimates so far made, from 25 to 40 per cent of the total tonnage is classified as anthracite. Coal of coking quality seems to be limited to a few fields, notably the Penhsihu field of Manchuria, the K'aip'ing field of Chihli, the Yi-hsien field of southern Shantung, and the P'inghsiang field of Kiangsi. Anthracite coal can be used as a metallurgical fuel, but it is not as efficient as coke.

Despite the huge tonnage available and the dense population of the country that would seem to constitute a large potential market, there has been comparatively little development of China's coal resources. Data of output are not complete or very accurate, but the present output is probably not much over 25,000,000 tons per year. The annual output since 1912 is given in Table XXI.

TABLE XXI.—COAL OUTPUT OF CHINA[1]
(Metric tons)

Year	Tons	Year	Tons
1912	13,000,000	1920	21,260,000
1913	14,000,000	1921	20,459,000
1914	15,000,000	1922	21,097,000
1915	15,440,000	1923	24,552,000
1916	15,584,000	1924	25,781,000
1917	17,205,000	1925	24,255,000
1918	18,340,000	1926	21,481,521
1919	20,055,000		

[1] The totals include the output of Manchuria. Returns for 1912–1917, China Year Book; 1918–1925, C. Y. HSIEH, *op. cit.;* 1926, China Year Book, 1929–1930.

In many parts of China underlain with extensive deposits of coal, the poorer people usually depend upon grass and twigs for cooking and for heating their homes, and fuel famines are common. With greater political stability, the establishment of cheap and efficient methods of transportation, and the introduction of capital, it is certain that China's coal output can be greatly increased. The demand may easily reach 200,000,000 or 300,000,000 tons per year if coal is generally adopted as a domestic fuel and if there is even a moderate development of transportation and manufacturing. The Chinese reserves are ample to meet such a demand and should be able to provide a surplus for shipment to Japan should the need arise. Much of the coal is situated, however, in the interior of the country and transportation charges will be high even if railroads are constructed connecting the mines with the sea. China will not be able to supply to Japan much coking coal since China, too, appears to be poor in that quality of coal. In still another sense, the Chinese coal may not be an asset to Japan, for it is likely that it will serve as the basis for the establishment of manufacturing industries in China that may offer serious competition to the industries of Japan.

IRON ORE RESOURCES

China is not so richly endowed with iron ore as with coal. For centuries, iron has been made in primitive native furnaces, and many of them are still in operation. These furnaces and the slag heaps about the sites of others convinced the earlier travelers in China that iron ore must be abundant. Many reports of occurrences of ore have also originated with observers who have had no geological or engineering training and have been deceived by surface indications. As a result, the belief in China's wealth in iron ore has become firmly established. Later investigations have shown that though there are a few large concentrations of ore, most of the numerous and widely scattered deposits are small and of low grade and are similar in their possibilities for development to the deposits of the Weald district of southern England and the bog ores of New England that supported an iron industry in the seventeenth and eighteenth centuries, making use of charcoal from the surrounding forests for fuel. They are quite satisfactory for use in the native furnaces with their small demands for ore and representing capital outlays so small that they can be abandoned when a particular ore supply is exhausted. They are of no value, however, for a modern iron plant with its expensive equipment consuming large quantities of ore and requiring an assured reserve for a long period. The iron industry of the Weald and of New England has disappeared and, in so far as it is dependent upon these small deposits and primitive plants, the iron industry of China will disappear. For a modern large scale industry to replace the ancient industry, the resources of iron ore are very limited.

Tegengren has summarized the existing knowledge of China's iron ore resources in his admirable memoir prepared for the Geological

Survey of China.[1] In the following table is presented his estimate of the actual and potential reserves classified by the geological character of the deposits. Their location is shown in Figure 109.

TABLE XXII.—IRON ORE RESERVES OF CHINA[1]

Reserves	Actual		Potential	
	Tonnage of ore	Tonnage of metallic iron contained	Tonnage of ore	Tonnage of metallic iron contained
Archean ores	295,000,000	110,000,000	477,000,000	159,000,000
Sinian ores, Hsüan Lung Region	28,000,000	15,000,000	64,000,000	36,000,000
Contact-metamorphic ores	73,000,000	41,000,000	9,600,000	4,800,000
Other types	....	....	5,100,000	2,400,000
Total	396,000,000	166,000,000	555,700,000	202,200,000

[1] *Op. cit.*, p. 293.

The combined total of 952,000,000 tons of actual and potential reserves might appear to be quite large and to bear out the prevailing western idea concerning the great iron ore wealth of China. The bulk of the ore, 772,000,000 tons or over 80 per cent, belongs in the first group, the Archean ores of Manchuria and northern Chihli. In the discussion of the Anshan and Miao-Erh-Kou deposits in the previous chapter, it has been pointed out that these ores are very low in iron content, averaging around 35 per cent, and very high in silica. They cannot be utilized successfully in a modern plant without preliminary concentration. Even the grand total, irrespective of the quality, is not impressive if it is remembered that the consumption of iron ore in the United States averaged about 63,000,000 tons per year during the five-year period 1924 to 1928. The total iron ore reserves of China, actual and potential, low grade and high grade, would be consumed by the United States in from 10 to 15 years. Additional reserves may be discovered, but it is not probable that they will be sufficient to alter the general conclusion that with any great degree of industrialization China's iron ore reserves will not meet even her own demands for iron and steel for any considerable period. They certainly cannot be depended upon by Japan as a basis for her industrialization.

THE HANYEHP'ING IRON AND COAL COMPANY

Japan first became interested in China's iron ore toward the end of the nineteenth century. The government had undertaken a vigorous program for the development of an iron and steel industry and the

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[1] TEGENGREN, *op. cit.*

Imperial Steel Works was being constructed at Yawata. The Japanese ore resources were known to be inadequate and it was imperative that supplies for the new industry should be assured. In 1899, a Japanese commercial firm made a loan to the Hanyang Iron Works, then the only modern iron plant in China.[1] It was provided that the loan should be repaid during the period 1900 to 1903 with shipments of iron ore from the Tayeh deposit on the Yangtze River owned by the Hanyang Iron Works. Similar agreements were entered into very shortly between the Hanyang concern and other Japanese interests including the Imperial Steel Works. It is upon these agreements, extended and renewed, that the present day claims of Japan upon the Chinese iron industry and iron ore resources depend.

The Hanyang Iron Works is located at Hanyang across the Han River from Hankow near its junction with the Yangtze. Its general situation is excellent geographically and it would appear to afford a good example of the reasoned location of a plant with a view to the best possible combination of advantages. About 80 miles to the east down the Yangtze River lies the Tayeh iron ore deposit. The P'inghsiang coal deposit, 325 miles to the south, is one of the few deposits of coking coal in China. Limestone occurs near the iron ore. The Hanyang-Hankow district is very well situated for transportation. It is the crossroads of China. The Yangtze River provides transportation downstream to Shanghai and the sea, and upstream as far as Ichang. The Han River from northwest China joins the Yangtze at Hankow. Running north and south and crossing the Yangtze at Hankow is a lowland corridor now occupied by one railroad running northward to Peking and another, partially completed, running southward to Canton.

All of these advantages of raw materials and transportation, favorable though they are, were of no significance, however, in the original location of the Hanyang Iron Works. The idea of an iron and steel works for China was first conceived about 1890 by Chang Chih-tung, a high government official, then Viceroy of Canton. He also proposed the building of a great railway running north and south across China from Canton to Peking, the metal for which was to be provided by the new iron and steel works. Machinery and equipment for the plant were ordered from England, but by the time of their delivery Chang Chih-tung had been transferred to Wuchang. In order to have the new plant under his supervision, he decided to establish it at Hanyang on the north side of the Yangtze opposite Wuchang rather than at Canton as he had intended originally. It is even said that he did not wish to have it out of his sight and, for that reason, selected a location that could be seen from his palace.

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[1] The historical summary of the Hanyehp'ing Company is taken largely from Tegengren, *op. cit.*

It was only after the construction of the plant had begun that consideration was given to the supply of raw materials. A Chinese business leader, Shêng-Kung-Pao of the China Merchants Steam Navigation Company, had recently discovered with the assistance of a foreign expert, the iron ore deposit at Tayeh about 80 miles down the Yangtze River from Hanyang. This deposit he offered to the new government works, and mining operations were begun in 1891 with capital borrowed from German sources. When the Hanyang blast furnaces were blown in in 1894, the coke had to be brought at great expense from the K'aip'ing mine near Tientsin in north China. Shêng-Kung-Pao took over from the government the management of the Hanyang works in 1896. Very shortly, a German engineer, whom he employed, discovered that the P'inghsiang deposit in Kiangsi Province contained coal suitable for coking. Modern machinery and coke ovens were installed, again with German capital, and mining was begun in 1898.

With the assurance of iron ore and fuel, the difficulties of the Hanyang plant were by no means at an end. The furnaces, as designed, were not suitable for the Tayeh ores, and alterations were necessary. There seems to have been a continual shortage of capital, and in 1899, the first loan was contracted with Japanese interests. The agreement for this loan and for later loans provided for repayment by the shipment of iron ore and pig iron to Japan at a fixed low price. The Chinese government withdrew from the enterprise in 1908, and it became a purely commercial concern. All of its properties, including the iron mine at Tayeh, the colliery at P'inghsiang, and the iron and steel plant at Hanyang, were consolidated in a joint-stock company under the name of the Hanyehp'ing Iron and Coal Company. In the Imperial decree sanctioning the new company, it was provided that the capital shares could be held only by Chinese subjects. Despite the new organization, the financial difficulties continued, partly because of the payment of dividends of 8 per cent annually, irrespective of the income, partly because of the contracts to ship ore and pig to Japan at unprofitable prices, and partly because of the damage to the plant during the revolution in the Hankow district in 1911.

A loan with the Yokohama Specie Bank and the Japanese Imperial Steel Works was contracted in 1913 that marked the distinct tightening of Japanese control over the Hanyehp'ing Company. The amount of the loan was 15,000,000 yen ($7,500,000 gold). Of the total, 6,000,000 yen ($3,000,000) was to be used for the redemption of short period loans, chiefly Japanese, and the balance for extensions and improvements at the iron works, colliery, and iron mine, including the construction of two new blast furnaces at Tayeh. As with the previous loans, principal and interest were to be repaid in iron ore and pig iron. By the original agreement, the allowance on the ore was fixed at $3 (Mexican) per ton and on the pig at $21 per ton. Due to the great increase in production costs during the World War, it was necessary to modify the allowance on the pig iron, but the new price, it is claimed, was still below the cost of production. In the loan contract of 1913, the Hanyehp'ing Company also agreed to sell pig iron and iron ore to Japanese interests beyond the shipments in repayment of the loans at a price to be agreed upon. Under this one contract, the company is committed to sell to Japan or to deliver on loan accounts a total of 15,000,000 tons of ore and 8,000,000 tons of pig iron during the 40-year period of the loan.[1]

To protect and perpetuate the Japanese control over the Hanyehp'ing Company, several drastic stipulations were included in the Twenty-one Demands presented to China in 1915. As originally formulated, Group III of the Demands provided that the company should eventually become a joint Chinese and Japanese enterprise and that the Chinese government would not permit the working of any iron ore deposits at Tayeh outside of the territory controlled by the Hanyang Company without the consent of the company. Because of the strong opposition by China, the stipulations were modified somewhat and as finally agreed to provided that

> . . . the relations between Japan and the Hanyehp'ing Company being very intimate, if those interested in the said company come to an agreement with the Japanese capitalists for cooperation, the Chinese government shall forthwith give its consent thereto. The Chinese government further agrees that, without the consent of the Japanese capitalists, China will not convert the company into a state enterprise, nor confiscate it, nor cause it to borrow and use foreign capital other than Japanese.[2]

The Hanyang Iron Works

The principal units of the Hanyehp'ing Coal and Iron Company are the iron and steel plant at Hanyang, the P'inghsiang colliery, the Tayeh iron mine, and the blast furnaces at Tayeh. The Hanyang plant includes two small 75-ton blast furnaces, now obsolete and blown out, two 250-ton furnaces completed in 1910 and 1915, seven basic open-hearth furnaces, and a rolling mill for blooms, rails, plates, and bars. The plant is fairly well located with reference to raw materials, but it has a number of serious disadvantages that add to the costs of production, especially in the making of steel. The site for the plant selected by the Viceroy, Chang Chih-tung, is accessible to water transport, but it is too restricted for any expansion or for efficient operation and it lies so low that the ground water has interfered with the operation of the open-hearth furnaces. The steel plant was not of the latest and most efficient design even when it was installed in 1907 and it soon became obsolete.[1] It was operated until 1922, however, and was then closed down. It is not likely that it will ever be possible to reopen the steel plant with its present equipment. At the time that operation stopped, it was reported that the cost of producing rails was $71 (gold) per ton. They could be imported from the United States and sold c.i.f. Shanghai at $50 (gold) per ton.[2]

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[1] TEGENGREN, *op. cit.*, p. 371.

[2] China's Official History of the Recent Sino-Japanese Treaties, etc., *op. cit.*

The blast furnaces at Hanyang continued in operation for a time, but under increasing difficulties and with a declining output. There have been no shipments of pig iron to Japan on the loan contracts since 1926 and in that year the deliveries were very small. The Hanyang furnaces were closed down completely in 1926 or 1927, and apparently have never been blown in again.[3] In Table XXIII is presented the output of pig iron and finished steel, mostly rails, at Hanyang.

The P'inghsiang Colliery

Coke has always been the major problem of the Hanyang works. The cost has been high, and the supply has not been dependable. Its complete stoppage was responsible for the recent closing down of the furnaces. The fuel has been obtained from the P'inghsiang colliery situated south of the Yangtze at Anyuan, 5 miles outside of the town of P'inghsiang in Kiangsi Province. It is about 325 miles by rail from the colliery to Wuchang where the coal or coke is transferred to barges for carriage across the Yangtze to Hanyang. The coal reserves at Anyuan have been estimated to contain from 100,000,000 to 300,000,000 tons. The coal cokes fairly well though it is high in ash (21 per cent) and in moisture content. The necessary washing and cleaning reduce the coal output by about 20 per cent and the ovens, partly non-recovery retort and partly rectangular Chinese ovens, are so inefficient that 1.6 tons of cleaned coal are required to make 1 ton of coke. Though the cost of the coal at the pit mouth is only $2 (gold) per ton, the various losses raise the cost of the coke at the ovens, materials plus conversion, to $6 (gold) per ton. When the rail charges and lighterage charges for

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[1] U. S. Bureau of Foreign and Domestic Commerce, Blast Furnaces and Steel Mills in China, unpublished report, LANSING W. HOYT, Aug. 15, 1922.

[2] *Op. cit.*

[3] K. L. HSUEH, "The Iron and Steel Industry in China," *Chinese Economic Journal, op. cit.*, January, 1928.

TABLE XXIII.—PIG IRON AND FINISHED STEEL OUTPUT, HANYANG[1]
(Tons)

Year	Pig iron	Finished steel
1900	25,890	
1901	28,805	
1902	15,800	
1903	38,875	
1904	38,771	
1905	32,314	
1906	50,622	
1907	62,148	8,538
1908	66,410	22,626
1909	74,405	39,000
1910	119,396	50,113
1911	83,337	38,640
1912	7,989	2,521
1913	97,513	42,637
1914	130,000	55,850
1915	136,531	48,367
1916	149,929	45,043
1917	149,664	42,651
1918	139,152	26,994
1919	166,096	3,684[2]
1920	126,305	38,260
1921	124,360	46,800
1922	148,424	Closed down
1923	73,018	
1924	26,977	
1925	53,482	

[1] TEGENGREN, *op. cit.*, p. 399; HSUEH, *op. cit.*

[2] All of pig iron output commandeered by Japanese creditors.

transporting the coke to Hanyang are added, the cost of the coke at the furnace is approximately $14 (gold) per ton, almost three times the cost at the Pittsburgh furnaces.[1] The production of cheap pig iron at Hanyang will never be possible as long as the cost of coke remains so high. It can undoubtedly be lowered, but only through greatly increased efficiency at the mines and coke ovens and in transportation to the furnaces.

The operation of the colliery and coke ovens was suspended in 1926 because the Hanyehping Company was in such straitened financial circumstances that it was unable to pay the workmen and was already nearly $1,000,000 (Mexican) in arrears in wages.[2] For a time, the Hanyang furnaces continued to operate on coke imported from Japan, but the cost must have been very high, since the price of coke in Japan, before any transportation charges have been added, is high. The P'inghsiang mine was finally reopened under the auspices of the labor union at Anyuan, but transport to the Yangtze has been very uncertain, due to the political disturbances. Table XXIV shows the output of coal and coke at P'inghsiang since 1916 up to the time of closing down.

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[1] U. S. Bureau of Foreign and Domestic Commerce, Coking Coal Properties of the Hanyehp'ing Iron and Coal Company (P'inghsiang Colliery), unpublished report, No. 4609, LANSING W. HOYT, Sept. 9, 1922.

[2] *Chinese Economic Bulletin*, Peking, June 11, 1927.

TABLE XXIV.—COAL AND COKE OUTPUT, P'INGHSIANG[1]
(Tons)

Year	Coal, run of mine	Coke
1916	992,494	266,418
1917	946,080	239,797
1918	694,433	216,013
1919	794,999	249,015
1920	824,500	263,000
1921	808,971	250,000 (est.)
1922	827,870	
1923	666,939	
1924	648,527	
1925	386,232	
1926	200,000	

[1] Data for 1916–1921, Coking Coal Properties of the Hanyehp'ing Iron and Coal Company, *op. cit.*; for 1922–1925, HSIEH, *op. cit.*; for 1926, estimate from China Year Book, *op. cit.*, 1929–1930.

The Tayeh Iron Mine

The Tayeh iron ore deposit is situated about 15 miles from the south bank of the Yangtze River some 65 miles downstream from Hanyang. It is connected with the river by a standard gage railway owned by the Hanyehp'ing Company. The railway, as built originally in 1891 when the mine was first opened, followed a very circuitous route due to the necessity of avoiding the many Chinese graves in the vicinity. More recently it has been straightened somewhat. The deposit has been worked for many centuries by the Chinese, and large slag dumps mark the sites of native furnaces dating back perhaps 1,000 years. Judging from the extent of the dumps, the industry must have been a very large and important one.[1]

The ore is a high grade hematite with about 58 per cent iron content and belongs to the group of deposits designated as contact metamorphic in Tegengren's table. The reserves have been estimated at 20,000,000 tons mineable by open-cut methods.[2] During the early years of modern mining, the output was only a few thousand tons.

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[1] U. S. Bureau of Foreign and Domestic Commerce, The Tayeh Iron Mines of the Hanyehp'ing Iron and Coal Company, Ltd., China, unpublished report, No. 4995, LANSING W. HOYT, Oct. 6, 1922.

[2] TEGENGREN, *op. cit.*, p. 192.

It was greatly increased in 1900 because of the contract for the delivery of ore made the previous year in connection with the Japanese loans. There was another increase in 1909 with the reorganization of the Hanyehp'ing Iron and Coal Company. The output since 1896 is presented in Table XXV.

TABLE XXV.—OUTPUT OF IRON ORE, TAYEH[1]
(Tons)

Year	Hanyehp'ing properties	Hsiang Pi-Shan properties (Provincial government)
1896	17,600	
1897	39,000	
1898	37,500	
1899	40,000	
1900	59,710	
1901	118,877	
1902	75,496	
1903	118,503	
1904	105,109	
1905	149,840	
1906	197,188	
1907	174,612	
1908	171,934	
1909	306,599	
1910	343,076	
1911	359,467	
1912	221,280	
1913	459,711	
1914	505,140	
1915	544,554	
1916	557,703	
1917	541,699	
1918	628,878	
1919	686,888	
1920	824,490	45,667
1921	650,000	161,575
1922	580,000	45,439
1923	486,631	148,406
1924	468,922	172,110
1925	321,330	214,272
1926	70,521	103,222
1927	111,073	76,623

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[1] Data for 1896–1922 from TEGENGREN, *op. cit.*, p. 295; for 1923–1924 from *Chinese Economic Journal*, *op. cit.*, January, 1928; for 1925–1927, China Year Book, *op. cit.*, 1929–1930.

It will be noted that the output at Tayeh is divided between two operating units. When the mining concession was granted to the Hanyang works, a part of the deposit was retained by the provincial government. Mining operations were begun in the government section in 1920 and are now carried on by the Hupeh Mining Bureau. The Yangtze Engineering Company erected a 100-ton furnace at Hankow in 1920. The company controls no raw materials and plans to use iron ore from the Tayeh mines of the Hupeh Mining Bureau and coal from the Liu Ho Kau mine on the Peking-Hankow Railway about 370 miles north of Hankow in Honan Province. Due to the political disturbances in the Hankow district, the operation of the furnace has been very irregular and costs have been high.[1] It was reported to be suspended in 1927.

In the 1913 loan agreement with Japan, the Hanyehp'ing Iron and Coal Company contracted to deliver to Japan in the next 40 years 15,000,000 tons of iron ore and 8,000,000 tons of pig iron equivalent to another 15,000,000 tons of ore, or a total of 30,000,000 tons. Such an obligation is more than a drain upon the Tayeh deposits, the only supply of ore under the control of the company. It is beyond their total capacity. The reserves at Tayeh have been estimated at about 20,000,000 tons and of this tonnage the Hanyehp'ing Company controls only a little more than half, the remainder being in the hands of the Hupeh provincial government. But if the company should be able to secure control and to exploit the entire deposit, it would fall short of meeting its obligations to Japan under the 1913 contract by about 10,000,000 tons. Additional ore must also be shipped to Japan on other contracts.

The Tayeh Blast Furnaces

The demand on the Tayeh iron mines is not limited to the Japanese commitments. Ore must also be supplied to the Chinese iron industry in the Yangtze Valley. The furnaces of the Hanyang Iron Works consume about 300,000 tons of ore per year, a part of which, in the form of pig, will supposedly reach Japan under the 1913 loan contract. Still another heavy drain on the Tayeh deposit was created by the construction of two 450-ton blast furnaces at the iron mines by the Hanyehp'ing Company, beginning in 1918. The funds for the furnaces were provided by the Japanese loan of 1913, and the furnaces were built with the approval, if not at the direction of the Japanese, in the hope that more pig would be available for shipment to Japan. The two new Tayeh furnaces operating at capacity would require about 500,000 tons of ore per year. It would appear that the Tayeh mines, on the basis of the requirements of the Chinese iron industry dependent upon them and of the present commitments to Japan, will be expected to supply between 45,000,000 and 50,000,000 tons of iron ore during the next 40 years, or more than twice the estimated total tonnage of the reserves. It is evident that too many claims on the Tayeh deposits have been established and that a conflict of interest is inevitable. If the needs of Japan are met, as set forth in the various loan agreements, there will be no iron ore or pig iron for China. If China, with growing political strength, asserts her claims to her own resources, there will be none for Japan. Additional reserves may be discovered at Tayeh, but it is not likely that they will be sufficient to meet the needs of both countries.

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[1] U. S. Bureau of Foreign and Domestic Commerce, Blast Furnace of the Yangtze Engineering Company, Hankow, China, unpublished report, No. 5268, LANSING W. HOYT, Oct. 19, 1922.

Up to the present time, the two new furnaces at Tayeh have not constituted any serious drain upon the ore reserves, for various difficulties have been experienced that have seriously limited their operation. They were designed by the technical adviser of the Hanyehp'ing Company and were supposed to include many innovations. Whether the design was faulty or whether the operating force has been to blame has never been determined with certainty, but the furnaces have not been successful. The first of the new furnaces was blown in in 1922, and within a month it was necessary to clean it out with dynamite because of a frozen charge. Many authorities are of the opinion that a 450-ton furnace is entirely too large for present conditions in China, especially with the quality of coke available. The furnaces are well located and do not have the disadvantages of the Hanyang plant. The land is well drained and there is plenty of room for expansion and for the construction of steel mills. Coke from the P'inghsiang colliery, transported to Tayeh via Wuchang, has been used during the brief periods of operation. It has proved to be very expensive, and if the furnaces are to be operated economically, a direct rail line must be built from the P'inghsiang colliery to Tayeh, a distance of about 180 miles. The new furnaces were reported to be suspended in 1927,[1] and it has not been possible to find any record of their operation since that time.

The Hanyehp'ing Iron and Coal Company has become more and more deeply involved financially in recent years, and further loans from Japan have been necessary. By the end of 1924, the Japanese loans totaled something over 57,000,000 yen ($28,500,000) and of that amount only 12,000,000 yen had been repaid.[2] Though the funds advanced were supposedly administered under joint Chinese and

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[1] HSUEH, *op. cit.*

[2] *Chinese Economic Bulletin, op. cit.*, June 11, 1927.

Japanese control, the Chinese apparently were successful in diverting large sums to uses other than those for which they were intended. A loan of 8,500,000 yen was made by Japan in 1925, and it was used, so it has been reported, to finance the Chinese civil wars.[1] The war lords have confiscated much of the equipment at the iron works and at the iron mines, especially the railway rolling stock. Despite past experiences, perhaps with the hope of retrieving some of the earlier loans, the Japanese government, through the Deposit Bureau of the Ministry of Finance, advanced an additional 2,000,000 yen to Hanyehp'ing in 1927.[2] In the agreement for this loan, there was provision for a greater degree of Japanese supervision over the finances of the company. In 1930, all of the loans to the Hanyehp'ing company were transferred from the Ministry of Finance to the Imperial Steel Works, the latter undertaking to repay them to the government from its profits. The total of the outstanding loans at that time was stated to be 49,000,000 yen ($25,500,000 gold).[3]

Summary of Japanese Relations with Hanyehp'ing Company

The efforts of Japan to secure iron ore and pig iron through the Hanyehp'ing Company have been valiant and persistent, but to an outside observer they would appear, on the whole, to have been ill-advised and futile. They are striking evidence of the crying need of Japan for iron ore and of the determination to secure it at any cost. The ventures in China have certainly been expensive and the results have not been very encouraging. The reserves of ore that have been brought under Japanese control are small and the shipments of both iron ore and pig iron have been irregular and never very large, as is shown in Table XXVI and in Figures 110 and 111. The output of ore at the company mines at Tayeh has been declining sharply since 1920, and no pig iron has reached Japan from the Hanyehp'ing furnaces since 1926. The deficiency has been met in part by increasing imports of pig from Manchuria. Through the exploitation of several new deposits in central China, a total of 858,000 tons of iron ore was shipped from China to Japan in 1928, but the supply was not sufficient even for the blast furnaces of the Imperial Steel Works at Yawata. If operated at capacity, they consume about 1,200,000 tons of ore per year, and plans for expansion have been announced that will increase the annual requirements by 600,000 tons. During 1926 and 1927, when conditions were especially disturbed along the Yangtze River, the

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[1] *Trans-Pacific, op. cit.*, Feb. 5, 1927.

[2] *Op. cit.*, Jan. 29, 1927.

[3] *Op. cit.*, Jan. 2, 1930; May 29, 1930.

TABLE XXVI.—JAPANESE IMPORTS OF IRON ORE AND PIG IRON FROM CHINA[1]
(Metric tons)

Year	Iron ore			
	Northern China	Central China[2]	Southern China	Total
1920	170,607	469,897	......	640,504
1921	79,660	360,109	......	439,769
1922	70,578	572,425	1,727	644,730
1923[3]	......	......	......	708,000
1924[3]	......	......	......	801,000
1925	219	813,272	......	813,491
1926	4,776	490,489	......	495,265
1927	26,730	473,555	......	500,285
1928	15,163	839,044	3,627	857,834
	Pig iron			
1920	2,377	135,848	......	138,225
1921	1,247	68,359	......	69,606
1922	......	125,337	1,666	127,000
1923[3]	......	......	......	98,640
1924[3]	......	......	......	165,240
1925	......	46,196	......	46,196
1926	......	3,796	......	3,796
1927	54	197	......	251
1928	......	......	......	0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] All of the pig iron from Central China is from the Hanyang works and in the earlier years most of the iron ore from Central China was from the Tayeh mines. Their proportion has declined considerably in recent years. Manchuria is not included in this table.

[3] Data by regions not available for 1923 and 1924.

shipments of ore fell off considerably, and it was necessary for the Imperial Steel Works to draw heavily upon accumulated stocks.

Not only is the quantity of materials received at present from the Hanyehp'ing properties inadequate, but there is no certainty that it will continue or that the present degree of control over the ore reserves can be maintained. The Tayeh deposit is one of the richest and most accessible reserves in China, and the Chinese leaders are fully aware of its value and wish to utilize it for furthering China's own plan of industrialization. It was reported in 1927 that the Nationalist government was contemplating the purchase of the Hanyehp'ing Iron and Coal Company. In January, 1928, it was necessary for the Japanese government to protest against the attachment of the Hanyehp'ing Company by the Nationalist forces; and in 1928 and 1929, the Hupeh provincial government was proceeding with plans to liquidate the company and to assume control over its finances.[1] Japan may be able to avert such action for the time being through vigorous diplomatic protests backed by the necessary show of force, but protests can be effective only so long as China remains weak. Such incidents indicate just how precarious is the Japanese hold on the Chinese iron ore resources.

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[1] *Trans-Pacific, op. cit.*, Feb. 6, 1927, Jan. 21, 1928, Apr. 18 and 25, 1929; *North China Herald*, Shanghai, Apr. 21, 1928.

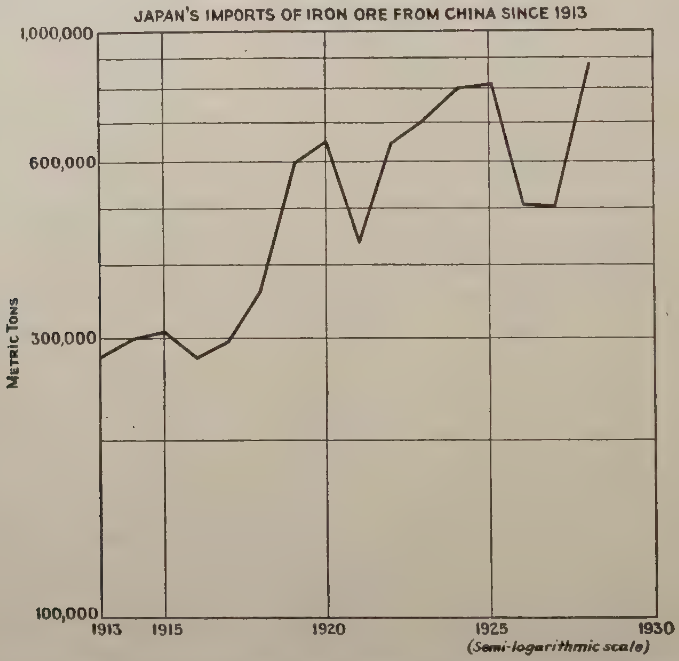

FIG. 110.—As a result of the political disturbances in China, there has been a decided fluctuation in the shipments of iron ore to Japan.[1]

OTHER IRON ORE DEPOSITS OF CHINA

Japan receives iron ore from three other fields in China—the Tangtu field at T'aip'ing and the T'aoch'ung field at Fanch'ang, both in Anhwei Province, and the Chinlingchen field in Shantung. The two Anhwei mines were opened by Chinese companies, but capital for the operation of the T'aoch'ung field has been obtained from Japan and the control is now Sino-Japanese. The loans are to be repaid by the shipment of ore to Japan. Both the T'aoch'ung and the Tangtu fields are situated on the Yangtze River a short distance above Nanking. The reserves are small, the two fields and the other fields of Anhwei associated with them containing probably not more than 12,000,000 tons.[2] The ore is of the same general type as that at Tayeh. The output of the fields since

[1] Data from the Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] TEGENGREN, *op. cit.*, pp. 207–235.

1918 is shown in Table XXVII. It is through the increasing production of these two fields that the flow of ore from China to Japan has been maintained despite the declining output at Tayeh.

The control of the Chinlingchen mine in Shantung was secured by Japan through the surrender by Germany of her rights in the peninsula as a result of the World War. The iron ore deposit, located 175 miles west of Tsingtao, was discovered by the Germans in 1899 during the construction of the Tsingtao-Tsinanfu Railway. Mining operations were begun by the railway company in 1914, but they were halted almost immediately by the outbreak of the World War and the occupation of Shantung by Japan. The Japanese prospected the deposits, and in 1919 mining operations were started. Though it was believed originally that the reserves were very large, subsequent investigations have reduced the estimates to less than 14,000,000 tons. The ore is of good grade, but with depth the iron content is decreasing and the silica content increasing.[1] The deposits are now under the control of a joint Sino-Japanese company as provided in the agreement signed in Washington in 1922. For some reason, the output fell off sharply after 1919, the first year of operation, and apparently since 1923 there has been no production.

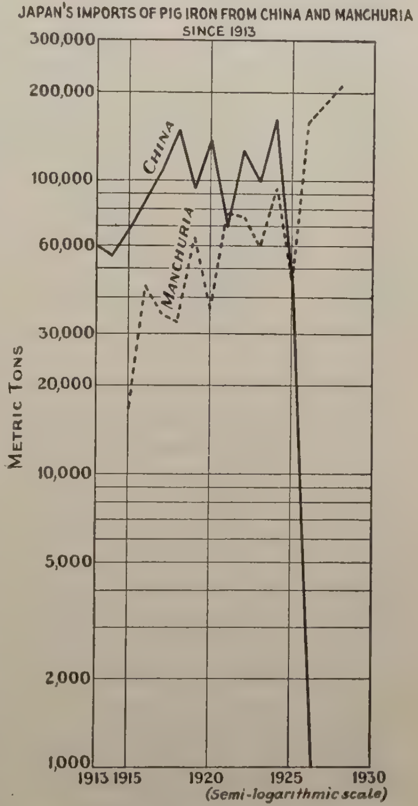

FIG. 111.—In recent years, China has failed completely as a source of pig iron and the deficit has been made up by increased imports from Manchuria.[2]

The most promising iron ore deposit in all of China, according to Bain, is situated in the rough mountain belt of the Hsüan Lung region 135 to 170 miles northwest of Peking. The deposits were examined in 1914 by the engineers of Okura and Company, a Japanese concern, but they were reported to be of no importance. They have since been investigated and mapped by the Chinese Geological Survey. The reserves have been estimated at approximately 90,000,000 tons. The ores are of comparatively good grade though the percentage of silica

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[1] TEGENGREN, *op. cit.*, pp. 149, 151.

[2] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

Table XXVII.—Summary Table of Iron Ore Output of China[1]
(Tons)

Sino-Japanese control

Year	Tayeh, Hupeh Province (Hanyehp'ing)	T'aoch'ung, Anhwei Province	Chin-lingchen, Shantung Province	Miao-Erh-Kou, Manchuria (Okura & Co.)	Anshan, Manchuria (South Manchuria Railway)	Total under Sino-Japanese control
1919	697,935	114,461	178,847	106,406	170,000	1,267,649
1920	824,491	81,810	128,164	105,239	155,000	1,295,704
1921	384,286	160,760	88,204	67,435	161,000	861,685
1922	345,631	267,400	26,335	no production	143,364	782,730
1923	486,631	301,650	7,618	25,513	188,218	1,009,630
1924	468,922	348,755	......	65,000	155,105	1,037,782
1925	321,330	387,000	......	65,000	157,996	931,326
1926	70,521	328,708	......	70,000	306,590	775,819
1927	111,073	233,250	......	70,000	371,000	785,323

Chinese control

Year	Tayeh, Hupeh Province (Hsiang Pi-shan)	Tangtu, Anhwei Province (Paohsing)	Total under Chinese control	Grand total	Percentage, Sino-Japanese of total output
1919	....	41,290	41,290	1,308,939	96.8
1920	45,667	44,389	90,056	1,385,760	93.5
1921	161,575	8,000	169,575	1,031,260	83.5
1922	45,439	34,583	80,022	862,752	90.7
1923	149,406	74,190	223,596	1,233,226	81.9
1924	172,110	55,840	227,950	1,265,732	81.9
1925	214,272	49,900	264,172	1,195,500	77.8
1926	103,222	....	103,222	879,041	88.3
1927	76,623	....	76,623	861,946	91.1

[1] Data from China Year Book, *op. cit.*, 1928 and 1929–1930; Tegengren, *op. cit.*, p. 295; *Chinese Economic Journal*, *op. cit.*, April, 1929; New York office of South Manchuria Railway Company; New York office of Okura and Company.

and phosphorus is rather high. They are well located for mining, but for some of the deposits transportation over difficult terrain must be provided. There has been some exploitation, and for a time in 1919 ore was shipped to the Hanyang Iron Works at Hanyang.[1] It is probable that the Chinese may be able to retain this deposit under their own control, since it is not favorably situated for the cheap transport of the ore to Japan, due to its inland position with no water outlet to the coast.

A 250-ton blast furnace was completed in 1922 about 11 miles west of Peking by the Lungyen Mining Administration to utilize the iron ore from the Hsüan Lung region. It is of good design and construction, and is said to be the best arranged plant in China or Manchuria. Because of political disturbances and a shortage of capital, the Lungyen furnace has never been blown in. Hoyt is of the opinion that if the furnace is to be successful financially, a steel plant must be constructed to provide a market for the pig iron.[1]

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[1] Tegengren, *op. cit.*, pp. 24*ff.*; Bain, *op. cit.*, p. 80.

The two remaining iron works of China are of little importance to the China supply and of no interest to Japan. They are very small, the two furnaces at the Hohsing plant in Shanghai having a combined annual output of 16,000 tons and the one furnace at the Paochun plant at Yangchien, Shansi, 7,200 tons.[2]

THE PENETRATION OF JAPANESE CAPITAL INTO CHINA

A large amount of Japanese capital has been invested in China in enterprises other than mining and the iron and steel industry. In a series of papers presented before the Kyoto Conference of the Institute of Pacific Relations, it was stated that the Japanese investments in China now total over 2,500,000,000 yen ($1,250,000,000).[3] The capital is principally in railways and warehouses, in banking, in the cotton spinning and weaving industry, and in mining. The improvement of transportation facilities in China and the strengthening of the financial system are both vital to Japan and will react to the advantage of her industries, for they will open the country to trade, stimulate the movement of goods, and increase the purchasing power of the Chinese people.

After transportation and banking, the cotton spinning and weaving industry is the most important field for Japanese investment in China. Japan now controls 43 per cent of the Chinese spindle capacity and 34 per cent of the factory looms.[4] Japanese capital, in much smaller amounts, has gone also into a number of other industries of China, including sugar refining, pottery making, match making, paper manufacturing, brewing and distilling, the extraction of vegetable oils, and the manufacture of machinery. This penetration of Japanese capital into Chinese manufacturing may not produce benefits so certain or so direct as those accruing from the development of transportation and banking. The use of Japanese capital in China diminishes the already scanty supply available for the industries of Japan Proper and it does not promote the Japanese program of industrialization. Its migration is a reflection of the many disadvantages of Japan for the development of manufacturing industry. It has gone to China to secure the advantage of the supposedly cheaper Chinese labor or to be near a source of raw materials or to escape the Chinese import tariffs. The capital is finding a profitable field, but the manufacturing plants that it has established employ Chinese labor; they do not provide an occupation for the Japanese workers. Japanese industries in China offer no solution for Japan's problem of population pressure. As they expand and become more and more successful, they must inevitably cut into the China market, and China is the principal export market for most of the Japanese manufacturing industries, especially the cotton industry. One of the causes of the present industrial depression in Japan is the growth of manufacturing in China. In time, the Chinese industries established by Japanese capital may also become active competitors of the industries of Japan Proper in markets outside of China.

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[1] U. S. Bureau of Foreign and Domestic Commerce, The Lungyen Blast Furnace, China, unpublished report, No. 6074, LANSING W. HOYT, Nov. 28, 1922.

[2] HSUEH, *op. cit.*

[3] *Far Eastern Review, op. cit.*, January, 1930.

[4] *Trans-Pacific, op. cit.*, June 26, 1930.

JAPAN'S SEARCH FOR IRON ORE IN OTHER LANDS

The penetration of Japanese commercial interests into China in their search for iron ore, often only thinly masking political interests, has been productive of meager results. It has been expensive and has contributed to the growing antagonism between the two countries. It has secured control of the greater part of the total Chinese ore output, but that total is not large, and in recent years there has been a decline both in the absolute output and in the relative importance of the mines under Japanese control (see Table XXVII). It has brought to Japan some pig iron and a fair supply of iron ore, but it has revealed no extensive reserves that can be depended upon for the future expansion of Japanese industries. The political unrest of recent years, with its disruption of commerce, has emphasized the danger of relying upon a single foreign source for a raw material so vital. That Japan is beginning to question the old concept of China as a land of vast mineral wealth is evidenced by the strenuous efforts that are being made to secure control of ore deposits in other countries within possible transport distance.

The Malay Peninsula

The most successful venture has been the development of the Bukit Medan iron mine in Johore, one of the Protected Malay States just to the north of the island of Singapore.[1] The ore deposit is situated on the Batu Pahat River about 18 miles from its mouth. A concession for working the deposit for a term of 21 years, with the privilege of renewal for a similar period, was obtained by Nangyo Kogyo Koshi, a Japanese company owned by the Ishihara family, and in 1920 mining operations were begun. The ore is hematite of good quality and at present is being extracted by open-cut methods. It is transported the short distance to the river on a light railway in hand-cars and then by barge 24 miles downstream to the mouth and out to sea to the waiting ocean vessels. A deep harbor is not available, and large ships must anchor in the open sea about 6 miles from the town of Batu Pahat. All of the output is shipped to the Imperial Steel Works at Yawata, and the ore is considered to be the finest quality received there. The mining company in 1926 owned three vessels and chartered seven or eight additional of about 8,000 tons each. The ships sometimes carry coal to Singapore on the return voyage, or they may return in ballast. The Ishihara interests have received financial assistance from the Japanese government in the exploitation of the Johore deposit.[1]

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[1] Data on Bukit Medan mine obtained by personal interview with Singapore manager of the operating company and from manuscript report on "Iron Ore in Johore," E. S. Wilburn, Assistant Geologist, Federated Malay States, September, 1926.

The imports of iron ore by Japan from the Malay States are shown in Table XXVIII. The table really represents the output of the Bukit Medan mine, for it is the only significant producing iron mine in the peninsula and all of its output goes to Japan. The shipments in 1927 more than equaled the reduced imports of ore from China.

TABLE XXVIII.—IMPORTS OF IRON ORE BY JAPAN FROM MALAY STATES[1]
(Metric tons)

1921	131,400
1922	168,000
1923	184,000
1924	266,000
1925	291,700
1926	290,040
1927	438,820

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

No estimates of the total reserves of the Bukit Medan ore body are available. The surface ore has been almost exhausted, and borings are being made and galleries driven into the hills preparatory to the sinking of a shaft. The ore is remarkably pure and appears to improve in quality with depth as is shown by the following analysis:[2]

	Small Lumps Mixed with Surface Soil	Secondary Precipitated Deposit	Subterranean Ore Body
Iron	64.42%	63.86%	69.51%
Silica	1.28	0.78	0.29
Manganese	0.26	0.10	0.13
Sulphur	0.034	....	0.029
Phosphorus	0.133	0.097	0.133

The ore is apparently superior to any so far received from China, having a higher iron content and a lower percentage of silica.

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[1] *Trans-Pacific, op. cit.*, p. 21, May 29, 1930.

[2] WILBURN, *op. cit.*

The Japanese company, Nangyo Kogyo Koshi, also owns a manganese mine near Sumgei Kemaman in Trengganu, another Protected Malay State, on the east coast of the peninsula. In 1925, 5,000 tons of manganese ore were exported, and in 1926, about 50,000 tons. The entire output of the mine is shipped to the Imperial Steel Works at Yawata. In the same area are deposits of iron ore, but as yet there has been no exploitation.

Australasia

It was reported in November, 1928, that a group of Japanese manufacturers had entered into a contract with the Australian Iron and Steel Company, Ltd., for the delivery of iron ore from the deposits in Yampi Sound on the northwest coast of Western Australia. By the terms of the contract, the shipments of ore are to be 150,000 tons for the first year, 300,000 tons for the second, 500,000 tons for the third, and thereafter 1,000,000 tons a year. The contract is for a period of 12 years and calls for the delivery of a total of about 10,000,000 tons of ore.[1]

The Yampi Sound iron ore deposits are the most important so far discovered in Western Australia. They are located on Koolan and Cockatoo Islands, and mining and transportation to the sea should be easy and economical. The ore bodies are estimated to contain reserves of about 100,000,000 tons, not a large total in comparison with the reserves of the United States or of France, but far larger than the reserves of Japan. The ore is above 60 per cent iron content with a low percentage of phosphorus and sulphur.[2] The Japanese Imperial Steel Works, in the past, has imported small quantities of the Australian ore for mixing.

The Australian contract, if carried through successfully, will give to Japan an important addition to her ore supply. It presents two difficulties, however, difficulties that attach also to dependence upon the Malay Peninsula or any other part of south Asia for ore. Iron ore is a bulky material with a relatively low value and, if it must be transported long distances, there should be available a return cargo for the vessels to ensure low freight rates. The balance of trade between Japan and Australia is already adverse to Japan both in value and in weight. In recent years, the Japanese imports from Australia have been more than double the value of the return commerce. They are such bulky commodities as raw wool, wheat, animal fats, zinc, and lead. The principal exports from Japan to Australia have been silk and cotton tissues[3]—scarcely the commodities to serve as a balancing return cargo for iron ore vessels. Fertilizer materials or coal would be much more suitable, but Japan has no fertilizer materials for export and, in fact, is importing large quantities, some from the islands north of Australia. Even if the Japanese reserves of coal were sufficiently large and could be worked at low enough costs to warrant large exports, shipments to Australia would be carrying coals to Newcastle, since the total reserves of Australia are estimated at 166,000,000,000 tons in comparison with less than 8,000,000,000 tons for Japan.[1] There is very little coal of good quality in Western Australia, but there is neither the population nor the industry to consume it and, if it is ever required, it can be transported by sea from the coastal mines of New South Wales or Victoria. It will be possible for Japan to send vessels in ballast to Australia to carry back the iron ore, but it is not probable that an iron and steel industry dependent upon such imports with the necessarily high freights can ever be more than a highly protected industry producing only for consumption within the country.

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[1] *Far Eastern Review*, Shanghai, November, 1928.

[2] TEGENGREN, *op. cit.*, p. 419.

[3] Mitsubishi *Monthly Circular*, *op. cit.*, March, 1928.

The second disadvantage of the Australian contract is the danger of being dependent for a raw material so essential in time of war upon a source of supply so distant. Modern warfare demands iron and steel in huge quantities. It would be a difficult task, if not an impossible one, for the Japanese navy in a contest with any major power to keep the sea routes open to Australia, the Malay Peninsula, or any overseas deposit other than those of the closely adjacent mainland of Asia. For national security, it would be necessary to hold in storage in Japan a reserve stock of ore sufficient for several years.

At about the same time that the contract was made with the Australian interests, it was announced that negotiations were under way with New Zealand authorities for the purchase of "an iron mine capable of producing all of Japan's requirements for many years to come."[2] The statement, in view of past experiences of Japan, would seem to be somewhat prematurely optimistic. There is a large deposit of iron ore on Golden Bay in the northwestern corner of South Island, New Zealand. The ore is chiefly a limonite with an iron content of from 40 to 60 per cent and a medium percentage of phosphorus. The reserve has been estimated at 64,000,000 tons.[3] In depending upon New Zealand for ore, the same difficulties must be considered that have already been pointed out with reference to Australia, though New Zealand would be a better market for any return cargoes of Japanese coal, since the coal reserves of New Zealand are much smaller than those of Australia and the density of the population is much greater.

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[1] Coal Resources of the World, *op. cit.*

[2] *Far Eastern Review*, *op. cit.*, November, 1928.

[3] TEGENGREN, *op. cit.*, p. 420.

India

By far the richest iron ore deposit of Asia is located in India in one of the native states of Bihar and Orissa in the northeastern part of the peninsula. It is one of the richest deposits of the world, and in magnitude it ranks with the Lorraine deposits of France and the Lake Superior deposits of the United States. Its extent has not been accurately determined as yet, but the reserve has been conservatively estimated at 3,000,000,000 tons of ore with a metallic content of 1,800,000,000 tons.[1] The ore is a hematite of an exceptionally high purity, and mining is carried on very cheaply by open-cut methods.

Japan has apparently made no attempt to secure ore from this source, or if the attempt has been made it has not been successful. Perhaps the distance from India to Japan has been considered too great a disadvantage. Not only is there the sea journey of 5,000 miles with its freight charges and the danger of disruption in the event of war, but the ore must be carried 200 miles by rail from the mine to the coast. The Indian deposit is being exploited, and a huge iron and steel plant employing 25,000 men has been erected at Jamshedpur by the Tata interests to utilize the ore. The supply of coking coal is satisfactory, and the plant can probably produce cheaper pig iron than any other plant in the world. It is from the Tata plant and from the plant at Asansol, operated by Burn and Company, and dependent upon the same ore supply, that Japan receives the greater part of her imports of pig iron.

Philippine Islands

A deposit much more accessible to Japan than the deposits of India or Australia or New Zealand is situated in Surigao Province in Mindanao, Philippine Islands. There have been small shipments to Japan. The ore is a laterite of the same general type as the ore of the Mayari deposits of Cuba, but slightly inferior to it. The reserves in a number of separate deposits in the district have been estimated at 430,000,000 tons.[2] As is the case with all laterite ores, the moisture content is high and special treatment is necessary to prepare the ores for the blast furnace. It should be possible, according to Bain, to produce from the Surigao ore a sinter of about 52 per cent iron content.[3] There is no suitable metallurgical fuel in the Philippine Islands, and it is conceivable that, if the iron ore deposits are ever worked, the iron industry of Japan will be the principal consumer of the output.

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[1] CYRIL S. FOX, "The Raw Materials for the Iron and Steel Industry of India," *Transactions of the Mining and Geological Institute of India*, Vol. 20, Part 2, July, 1925.

[2] TEGENGREN, *op. cit.*, p. 412.

[3] BAIN, *op. cit.*, p. 104.

Throughout the islands of southeastern Asia and in some sections of the adjacent mainland, there are numerous deposits of laterite ores. Most of them, however, are less accessible to Japan than are the deposits of the Philippine Islands. In general, because of the necessity of preliminary treatment and also because of the complications experienced in steel making, due to the other metals associated with the iron in the ore, the laterites cannot be utilized economically at the present time. They should be considered as a great reserve to be drawn upon only when the supplies of hard ore, now so important, are depleted.

SUMMARY

From the foregoing survey of the essential raw materials for manufacture, it is evident that a poverty in iron ore and coking coal is the most fundamental industrial weakness of Japan. It is a weakness that cannot be overcome, or at least, there is no prospect at the present time of overcoming it. The iron ore reserves now available in Japan Proper are inadequate even for an industry of moderate size, and there is practically no coking coal. There is little hope of any new discoveries of coal or iron ore, and though strenuous efforts have been made to supplement the scanty domestic supply through the control—political or commercial—of resources in neighboring countries, the results have been far from encouraging. Either the countries have proved to be as poor as Japan or transport over a long distance has been necessary, increasing the costs of production in peace time and exposing Japan to a possible cutting off of supplies in time of war. The poverty of iron ore has already marked Japanese manufacturing industry, and it will continue to do so. There can be no great development of primary metallurgy or of the secondary fabrication industries that have played so important a part in the industrial growth of the United States, England, and Germany, and have contributed so materially to the foreign trade of those countries.

It is stated frequently by Occidental writers that Japan and the neighboring countries of the Far East do not and will not require a large steel industry because the per capita consumption of steel will probably never equal that of the United States and other great industrial countries,[1] and that the scarcity of iron ore is, therefore, of no particular significance. Such statements confuse cause and effect. It is true that the per capita consumption of iron and steel is small, but it is small and will remain small because the Oriental countries cannot expect to attain any high degree of industrialization. And the principal obstacle standing in the way of industrialization is the scarcity of the essential raw materials for the iron and steel industry, for iron and steel provide the framework of any modern system of industry and transportation. The argument seems to proceed in a circle. The economic position of the Far East can be summarized much more directly and more concisely by simply stating that the Oriental countries, with the possible exception of India, due to their poverty of iron ore and coking coal, cannot look forward to any high degree of industrialization. Of all of the countries of Asia, Japan is making the most intensive effort to develop manufacturing industries, and Japan is the poorest in iron ore and in coking coal.

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[1] Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.*, p. 19.

Industrialization does not depend upon raw materials alone. It rests also upon the labor supply and upon the possibility of disposing of the manufactured goods advantageously. In the following chapters will be presented an analysis of Japanese labor, its abundance, its efficiency, and its cost, and a survey of the markets open to Japan and of their relation to the development of manufacturing.

CHAPTER XIX

THE LABOR SUPPLY

LABOR is the chief industrial asset of Japan. With few resources in power or raw materials, a limited supply of capital, and no especial distinction in mechanical skill, Japan has built an industrial system upon cheap labor, and labor is the principal commodity that Japan is able to offer in international markets. Raw silk, the one abundant raw material of the country and its chief export, is largely the product of labor. Cotton textiles, of next importance in the industrial system and in trade, are fabricated from imported raw materials and the Japanese contribution to their manufacture is labor. For the iron and steel industry, the native supplies of coal are unsatisfactory and of iron ore, negligible. The remaining manufacturing industries of the country are either factory industries heavily subsidized to offset natural handicaps, or household industries consuming relatively insignificant quantities of raw materials and dependent upon the skill and the abundance and the cheapness of the labor supply.

The setting for an abundant labor supply for industrial expansion would seem to be ideal. The country is small, and the population is large and increasing by about 900,000 per year. The density per square mile is similar to the density in England, Belgium, and other highly industrialized countries of Europe. If only the arable lands are considered, there is an average of 2,500 people per square mile. The rural areas are overcrowded, and there is much unrest among the small farmers and the farm tenants. The farm of usual size has only about 2½ acres or ½ acre per capita. Subsidies are being given to encourage people to emigrate to other countries, and every branch of the government is engaged in seeking an outlet for the surplus population.

Under such circumstances, it might seem absurd to question the abundance of labor, but all the crowding has not created a labor supply readily available for factory industry. Manufacturing industry has not attracted the surplus population and has not been able to make effective use of what appears to be its principal asset. In a land of such numbers and so low a standard of living, relatively, it might seem even more absurd to question the cheapness of the labor supply, but in Japan, labor for manufacturing industries has been neither abundant nor especially cheap.

THE SCARCITY OF FACTORY LABOR

It is one of the paradoxes of the Orient, of India and China as well as of Japan, that manufacturing industry suffers from a scarcity of labor. Except in abnormal times, there is no floating industrial population easily tapped by the factory industries. The factory system has been precipitated upon the nation without the gradual upbuilding of a factory population. Labor in Japan has been agricultural. The farms are overpopulated, but the people are attached to the land and labor is reluctant to enter the factory. Industry, in the past, has not been a pied piper luring the excess population helter skelter from the rural areas. The workers have come most unwillingly and only under pressure. The recruiting of labor has been a necessity.

The textile industries, especially, have had to depend upon the recruiting agents for their labor supply. They are organized to use large numbers of women and children in the operation of the mills, and these women and children, generally, have not been available from city populations. The excess population has been on the farms, not concentrated in large cities, and the Japanese textile mills, to a large extent, have had to draw their labor force from the farming centers.

Many of the cotton mills have located in farming country away from established industrial centers, for the sake of their labor supply. Only 43 per cent of the cotton spindles are in cities.[1] But the local labor supply has rarely been sufficient for the operation of the factories in the cities or in the country, and labor has had to be transported from other and distant districts to operate the mills.

The Recruiting of Labor

In order to persuade the country boy or girl to leave the farm, poor as it is, the recruiting agents paint glowing pictures of the high wages that may be earned and of the glories of dormitory life, for the recruited labor is housed by the employer in great dormitories within the factory gates. But the promises of the recruiter are not generally sufficient to pry these farmer lads and lassies from their homes, unless he provides something more substantial in the way of a present for the girl or boy and a loan on their wages to the parents, pays their car fare to the mill, and meets the sundry expenses en route. Even then recruiting is most successful in the districts where farming is especially precarious, those areas where the peasant can get only one crop from the rice land. Much of the rice land in Niigata Prefecture, for instance, cannot be drained for a winter crop, and Niigata has become famous as a source of factory workers, prostitutes for the licensed quarters of the big cities, and bath men in public houses—an occupation considered to be degrading.

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[1] Estimated from the Japan Cotton Spinners' Association, Semiannual Report (in Japanese), *op. cit.*, December, 1928.

The recruiting of country labor is sufficiently difficult to cause some of the agents to make promises that are not fulfilled by their factories and otherwise to use false inducements. So great is this abuse that the government in 1924 passed regulations for the recruitment of workers by which it forbids the hiding of the true facts of employment from the worker through exaggeration or false statement by the recruiter, and the forcing of employment or other acts injurious to the good morals of the recruits. The recruiting agent is further required to give the recruited worker the full particulars of employment with regard to hours, wages, holidays, sleeping quarters, cost of boarding, period of employment, etc. But despite regulations, recruits are often misled. The Commission on Women's Labour Problems of the Japanese Association for International Labour Legislation in 1926 recommended, among other measures necessary for the improvement of conditions in silk filatures, the strict enforcement of the regulations for the control

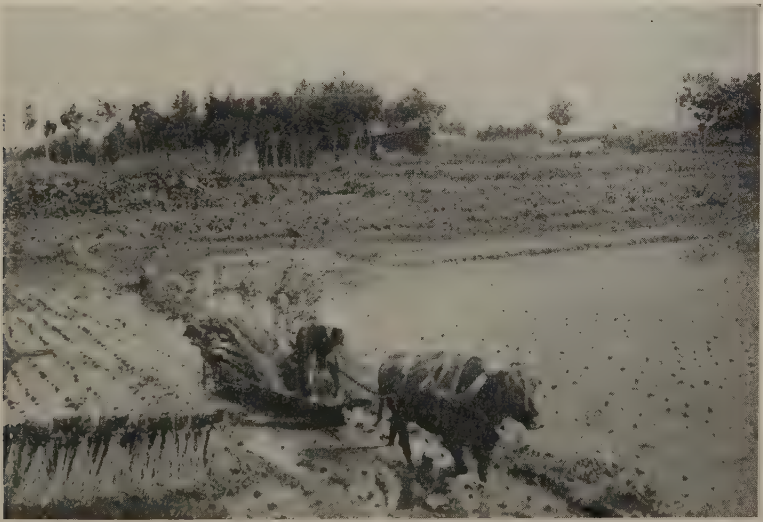

FIG. 112.—The land of Niigata cannot be drained and only one crop a year can be produced. The prefecture is for that reason an area of surplus population and an important source of factory labor.

of recruitment; and in 1928 the labor unions were demanding the abolition of abuses in recruiting.

The recruiting of labor becomes a significant item in the labor costs of the Japanese manufacturer, especially when it must be done over and over again. One of the large cotton spinning companies in Osaka pays an agent in Kyushu a commission of $3.50 for each girl recruit in addition to the car fare and other items of expense involved in getting the worker from the farm to the factory. Other companies send out their own agents to bring the recruits to the factory. It is true that the advance for car fare and the loans made to the parents or to the girl herself are generally recovered by the companies in periodic deductions from the wages of the worker, but the commission to the agents and some of the presents made are expenses borne by the companies.

The expense of securing one female hand, according to estimates made by the Japan Cotton Spinners' Association in 1919, ranged from $3 to $25, and when indirect expenses were added, more than $25 was needed for employing one female. Various textile mills reported in 1920–1921 that the "premium for getting workers," including the commission to the agent, the railroad fares involved, gifts to the girls and advances to parents, amounted to from 8 to 12 per cent of what was paid in direct wages.[1]

The problem of securing labor for factories in this overpopulated land is somewhat more difficult than selecting a force from the waiting applicants at the gates of the mill. There are no records of the numbers of factory workers recruited each year, but it has been estimated that 42 per cent of all the workers under the Factory Act are living in factory dormitories.[2] It is probable that this 42 per cent also represents a fair estimate of the total number of workers recruited from distant parts.

Labor Piracy

It may be said that, after all, the recruiting of raw labor is to be expected in a newly industrialized country. That is true, but Japan is a land overpopulated and industrialization has been in progress for 75 years, and yet the problem of securing labor is still acute. The recruited labor does not become permanently industrial. Once introduced into the factory, it does not stay. It comes reluctantly, and the period of service is short. Experience has shown that the girl recruits, and most of the recruits are girls—about 84 per cent[3]—return to the farm as soon as they have worked out the advance made to their parents, or have saved enough for a marriage dowry, or have completed their contract, or otherwise freed themselves of the obligation that kept them at the mill. Japanese labor not only has to be recruited to establish a mill but it must be recruited over and over, year after year, to keep the mill going.

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[1] U. S. Tariff Commission, The Japanese Cotton Industry and Trade, pp. 108–109, 1921.

[2] *Industrial and Labour Information*, *op. cit.*, Vol. 20, No. 11, Dec. 13, 1926, p. 481; Shuichi Harada, Labour Conditions in Japan, p. 121.

[3] *Op. cit.*

In the early days of industry in Japan, labor was so scarce and so difficult to obtain for industrial purposes that it was not uncommon for one factory to steal the labor force of another. According to the Suwa County Raw Silk Trade Association, one of the principal functions of trade associations has been the settlement between factories of disputes over the piracy of workers. If the girls could be lured from one mill compound to another, they were kept by the second mill for its labor force, locked behind the barred gates of the mill premises. It soon became expedient for all the factories to lock their high gates and to keep their girl workers strictly within the compound. This practice of locking in the female labor still continues in most of the textile plants. Once the girl or woman has been recruited for the factory, she is not allowed to leave the grounds without permission from a company official. That the practice is more than the relic of an old policy is evidenced by the fact that permission to leave the factory grounds is difficult to secure and does not come to any one girl more than two or four times a month.

In a strike against the Dai Nippon Spinning Company in 1927, officers of that company stated that female operatives were not allowed to leave the factory compound more than four times a month.[1] In this plant, there were 2,600 girl operatives, fifteen to sixteen years of age, living in the company's dormitories and confined to the mill premises. Officers in the plants of three other large and important spinning companies, personally investigated in 1926, stated a similar policy. The girls were not permitted to leave the factory grounds except on holidays and with permission. In a fourth large spinning mill, it was stated that the girls and women were permitted to go beyond the factory gates only if the local labor union assumed the responsibility. In this particular mill, the dormitories and the factory are surrounded by a high board fence, the gates are locked at night, and the only exit to the outer world is through a turnstile by the office. Whatever freedom the union has obtained for its members is under the watchful eye of the management. In one large textile mill at which it was said the girls were quite free to come and go through the factory gates, the surrounding territory is taken up by company houses for married workers and the mill is at a great distance from Tokyo, the nearest city, and is not in the immediate vicinity of other mills. According to labor union officials, the practice of locking the girls and women behind the factory gates is well-nigh universal in the large textile mills where the female labor is so important.

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[1] *Trans-Pacific*, *op. cit.*, June 25, 1927.

It is generally claimed by employers that the restrictions on the freedom of girl workers are for their own protection, that they are young and inexperienced and that, since the management has recruited these workers from their farms and brought them to live in an industrial community, they feel a responsibility for the girls in their unfamiliar surroundings. There may be some sincerity in such claims, but the original impetus was the labor pirating of other companies, and even at the present, the locked gates serve the management more than they protect the workers. The young country girls get terribly homesick and many of them run away, but under such close supervision, it is not so easy for a girl to break her contract and return to the farm before her year is up. For those who remain, close supervision and restricted freedom hinder the growth of unionism. If a strike is called, the dormitory workers are locked in the factory grounds and cut off from all communication with the strikers outside—the men workers and the women who live at home. Of course, the workers manage in devious ways to surmount these obstacles in a serious strike, but the barred gates of the factory compound are a distinct advantage in breaking a good many strikes.

Labor Turnover

There is a constant and heavy labor turnover in all Japanese industries that prevents the development of any great body of skilled industrial workers. The present employers of factory labor in Japan have little more advantage in the employment of labor than had their forbears, the pioneers who opened the first spinning mills and operated the first power driven machinery. Their labor supply is scarcely more trained than the workers in the first model factories set up by the government. In textile mills, it is not unusual for the labor turnover to range from 40 to 60 per cent of the force per year. It is said that the girls generally stay from one to three years.[1] An investigation by the Japan Cotton Spinners' Association in 1919 showed that 45 per cent of the operatives remained with the mills less than one year, and only 21 per cent of the force remained over two years, the average length of stay being one year and five months.

Even in the engineering trades employing mostly male workers, there is a heavy labor turnover. A factory in Tokyo producing electrical equipment had in 1926 a total of 101 men and 83 women workers whose terms of employment had the following distribution:[2]

[1] Personal investigation of mills, 1926.

[2] Personal investigation.

	Percentage employed by firm for					Total
	More than 10 years	5 to 10 years	3 to 5 years	1 to 3 years	Under 1 year	
Men	3.0	11.9	7.9	42.6	34.6	100
Women	1.2	2.4	1.2	29.0	66.2	100
All workers	2.2	7.6	4.9	36.4	48.9	100

According to the government Bureau of Social Affairs, the labor turnover for 1925 was 58 per cent in textile mills, 42 per cent in engineering, 35 per cent in the chemical industry, and 65 per cent in miscellaneous industries.[1]

It is the general opinion that a large labor turnover among the female labor of textile mills is inevitable. The theory is that the girls come to the factory only to earn their marriage dowry or secure a loan for their parents and that, when that is accomplished, they inevitably return to their homes and marry. A good many girls undoubtedly follow this course; there is little else to attach them to their jobs. But the same thing is said of young girl labor in every land, and yet there are hundreds of women who never marry or who marry and return to labor outside their homes.

Labor turnover is not a visitation from heaven. It has its causes in the industrial system, and many of these can be eliminated. The long hours of labor, the night work, the dormitory system, the restricted freedom, and the low wages of the individual are important causes. The very cheapness of the labor induces a turnover.

UNEMPLOYMENT

Unemployment has been a serious problem in Japan only in very recent years, when the industries, overexpanded under the stimulus of exceptional war and postwar demands, have found themselves overmanned for present industrial conditions. A census of unemployment for Japan was first undertaken in October, 1925, under an Imperial ordinance. The number of workers unemployed for more than three days at the time of the census totaled 105,612 persons, of whom over one-third were workers by the day, the class most liable to unemployment. The number of factory workers unemployed at that time constituted less than one-fifth of the total unemployed and a very small part of the factory population.[2] The years since 1925 have been more disturbed by panics, industrial curtailments and business depressions, and unemployment has increased. In August, 1929, an investigation of

[1] HARADA, *op. cit.*, p. 129.

[2] Résumé Statistique, *op. cit.*, 1928, p. 109.

the extent of unemployment was undertaken by the Bureau of Social Affairs of the Home Ministry. About 6,500,000 workers were investigated and of this group, the total number of able-bodied workers who had been out of work for more than one week prior to September 1, 1929, was found to be 268,590, or 4 per cent of the total. The rate at the end of November, 1929, had risen to 4.5 per cent, and in December to 4.7 per cent. The problem appears to be growing, but the period covered by the investigations in 1929 was characterized by severe business depression. Also, the rate was greatly increased by the higher percentage of unemployment among day laborers and salaried workers. For November, 1929, the investigation disclosed the rate of unemployment for day laborers to be 7.67 per cent, for salaried workers to be 3.86 per cent, and for regular labor to be 3.52 per cent.[1] That the unemployment situation has not been more critical in Japan under the pressure of severe business depression is due to the fact that many factories have made use of the high labor turnover to cut down the labor force, and recruiting has temporarily slackened.

The salaried class in Japan has suffered from unemployment for many years, due mainly to a disinclination on the part of students in the higher schools and colleges to take up technical education. The Ministry of Education is beginning to emphasize the importance of technical education in order to counteract this tendency among the students and has instructed local authorities not to encourage graduates from elementary schools to go up to the higher and middle schools unless they are especially qualified both in character and surroundings. But even the graduates of the primary schools prefer work in department stores and banks and in domestic service to labor in a factory. An investigation by the Prefectural Employment Office in Tokyo in the early part of 1930 revealed that the number of applicants for factory work among recent graduates of primary schools was very small, while the demand for factory labor was double the supply.[2] It would appear that Japanese workers, in spite of the specter of unemployment, are loath to enter the factory.

THE CHEAPNESS OF LABOR

Throughout the process of industrialization in Japan, industry has depended on so-called cheap labor. Wages have been low, working hours long, and labor, for the most part, unorganized. And yet, Japanese labor has not been really cheap, certainly not as cheap as it is considered to be by western industrialists or even by the Japanese employers.

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[1] Statistics of unemployment as announced by the Home Ministry and published in Mitsubishi *Monthly Circular*, *op. cit.*, November, 1929, and *Trans-Pacific, op. cit.*, Mar. 13 and 20, 1930.

[2] *Trans-Pacific, op. cit.*, Mar. 20, 1930.

Labor is dear or cheap to industry according to the labor cost per unit of output, not according to the wage per worker. The output of the worker in Japan is low compared with the output of workers in western countries. Though the individual worker is cheap, collective labor costs are not particularly low. The element of skill has been neglected for the cheapness of the individual. Efficiency has been sacrificed to low wages.

But it is not at all surprising that Japanese industrialists have failed to question the advantages of cheap labor. They, as individuals, are not primarily concerned with the future development of industry and the economic position of the nation 50 years hence; nor has their industrial background been of a nature likely to start them questioning along these lines. Modern industry, in Japan, exists side by side with domestic workshops. Under the autocratic paternalism of household industry, labor receives little if any reward in wages. The skilled craftsmen are paid a wage, but apprentices earn their board, lodging and clothing, with perhaps some spending money now and then on holidays, but no daily or weekly wage. The workshop is the home of the master craftsman, and the workers live as members of the family. They work long hours for little pay. The personal equation is very important.

Only recently, it was reported by the Social Work Bureau of the Home Office that there are 2,000 small domestic workshops in the Honjo and Fukagawa districts of Tokyo City alone, and most of them have operated for generations under the feudal system, with 10 to 30 apprentices living in the home of the proprietor under a definite term of service until they have learned the trade.

Most Japanese industry, in spite of the development of western mechanical industry in the past half century, is still organized on this feudal system. Nearly all products for purely Japanese consumption are made under the family system. Japanese clothing is made in the home of the master tailor who may have 12 to 100 workers living under his roof, to only 10 per cent of whom he pays any wage. The rest are apprentices. The same is true of the cabinet maker, the lacquerer, the lantern maker, the mat maker, and the many thousands of small establishments that produce the necessities and luxuries of Japanese life.

Either the household is the factory and the work is done with the aid of apprentices or, if the work is not highly skilled, the Japanese merchant or jobber makes use of the spare time labor of women and children and old men in the neighborhood at very low pay. Bundles of materials are sent out to the families, trundled through the streets on man-drawn carts, and returned in the same way when the operation has been completed. It may be that the article will be partially prepared in a factory and sent out to the home workers for one simple operation only. Japanese shoes and paper umbrellas, matches, and even some cloth are produced in this way. It is extremely cheap labor.

In the raising of cocoons for the raw silk industry—Japan's major factory industry—the labor element is greatly discounted. The raw material for this important industry is raised in over 2,000,000[1] different homes with essentially family labor. The wives and children of the farmers care for the worms during the tedious period before they spin their cocoons. Little if any outside labor is used, for few farmers are raising cocoons on a very large scale. There is no payment of wages and the labor costs are therefore not a positive factor in determining the price of cocoons. Japanese industry has long had the tradition of cheap labor. The modern industries of Japan have accepted that tradition as their own, and cheap individual labor is the common practice.

The Level of Wages

The wage system in the modern industries varies with each industry and each factory and according to the operation. The same factory may have some workers on piece work, some on a time basis with a production bonus, some with a monthly wage, and some partially on piece work and partially on time work. Throughout Japanese industry, the wage rates are low whatever the system.

To the daily or monthly money wages of the workers, a bonus must be added, for in all industries and in practically every factory, the bonus system prevails, a survival of the feudal paternalism. There are variations in the bonus practice according to the individual plant, but in general, an incentive bonus is paid to the workers twice a year, in January and again in July, the amount varying for each individual according to the whim of the management and the state of business. It has been estimated that the semiannual bonus of the average cotton mill hand in the prosperous days of 1919 amounted to $15.[2] Generally, there is extreme variation in the individual amounts. In one of the largest cotton mills of the country, the half-yearly bonus in 1925 varied all the way from 50 cents to $250. The July 1926 bonus envelopes of 35 workers in another textile plant, which were posted on the bulletin board of the local union for the edification of its members, varied from $3.50, the lowest, for a woman worker, to $83.50 to one of the men. Most of the amounts were on the lower scale. The workers themselves had no idea on what basis the distinctions were made.

[1] Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, 1928, p. 23.

[2] The Japanese Cotton Industry and Trade, *op. cit.*, p. 107.

The Japanese Cotton Spinners' Association estimated in 1919 that the semiannual bonus in spinning plants varied from 5 to 30 per cent of the daily wage, or an addition of from 2 to 20 cents on the per diem wage of the worker.[1] But that was when the industries of Japan were in the heyday of the golden postwar boom. In ordinary years, the semiannual bonus would probably not add so much to the average wage of the worker. The average bonus payment of an oil company in Tokyo is from $2.50 to $3.50 twice a year.

TABLE XXIX.—THE AVERAGE DAILY MONEY WAGE OF WORKERS IN JAPANESE INDUSTRIES IN 1926[1]
(Includes wages and bonuses and cash allowances)

Industry	Number of factories	Male	Female	Average
Ceramics	51	$1.17	$0.49	$1.08
Metals	57	1.42	0.57	1.37
Machine and tools	112	1.41	0.65	1.37
Chemicals	61	1.01	0.46	0.84
Textiles	215	0.78	0.47	0.54
Paper	30	0.93	0.45	0.84
Fur, bone, horn, and feathers	5	1.64	0.63	1.62
Wood and bamboo	24	0.97	0.45	0.92
Food	79	0.99	0.46	0.86
Clothing	17	0.90	0.50	0.64
Building	2	1.61	0.37	1.48
Printing and binding	30	1.01	0.55	0.93
Ornaments	4	1.19	0.51	1.10
Electricity and gas	7	1.18	0.62	1.17
Miscellaneous	3	1.09	0.52	1.06
Total	697	$1.17	$0.48	$0.85

[1] Résumé Statistique, *op. cit.*, 1928. Wages have been converted to American currency.

The wage data of the government for 1926 for the important industries are given in Table XXIX. They include an allowance for the semiannual bonus. They do not represent the wage from the point of view of the worker, but are rather the average wage cost per working day per worker. Being averages, the extremes exercise too great an influence for their numbers, and no allowance is made for time lost by individuals, or for minor changes in personnel. They are useful primarily as a general basis for comparison with similar figures of other countries. The average wage cost of men workers in 1926 ranged from 78 cents to $1.64 a day, and for women workers, from 37 to 63 cents a day.

An idea of wage levels from the point of view of the individual worker is perhaps better obtained from Table XXX which contains a collection of the high, low, and usual wages of men and women workers in 59 factories visited in 1926. In the cotton spinning industry, the usual wage for a girl spinner in 1926 was about 60 cents a day not including any allowance for the semiannual bonus which would add but a few cents to the daily wage. But the average daily wage per female worker in cotton spinning, according to government figures for April, 1926, was 39 cents. The discrepancy discloses the weakness of the average wage. The 60 cents represents the ordinary pay of a large class of workers for each day of labor in the factory. A girl going into a cotton mill for the first time can expect to earn about 30 cents a day. After she has been there a while, she may look forward to earning 60 cents a day. If she stays a long time and becomes quite skilled, she may advance to $1.25 a day. The 39 cents is an average of the pay of all the classes of cotton spinning workers for the 27 days the factories were running in April, 1926. It includes the high and the low, the skilled and the unskilled of the female workers. On this basis, a mill owner

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[1] Cotton Mills and Workers in Modern Japan, *op. cit.*, p. 17.

TABLE XXX.—SOME TYPICAL DAILY WAGES IN JAPAN IN 1926[1]
(Not including the bonus allowances)

Industry	Number of factories	Male			Female		
		High	Low	Usual	High	Low	Usual
Ceramics	11	$2.00	$0.25	$1.25	$2.00	$0.25	$0.50 to $0.90
Copper mining and smelting	2	3.50	0.60	1.00 to 1.25	0.65	0.25	0.40 to 0.45
Engineering	3	6.00	1.00	1.50 to 2.00	.....	....	1.25
Electrical appliances	3	5.00	0.50	0.88	0.84	0.30	0.60
Hardware	3	1.75	.....	1.00 to 1.30	.....	....	0.40 to 0.65
Glass	3	2.50	0.50	1.50	1.00	0.50	....
Rubber	2	.....	.....	1.00 to 1.25	.....	....	0.75 to 1.00
Matches	2	.....	.....	0.75	.....	....	0.40
Raw silk	9	.....	.....	....	1.30	0.12½	0.45 to 0.75
Cotton spinning	3	1.50	0.40	0.75 to 0.90	1.25	0.30	0.60
Cotton weaving	4	1.50	.....	0.65 to 0.70	1.00	0.50	0.50 to 0.70
Wool spinning and weaving	2	3.70	.....	0.75 to 0.90	3.70	0.30	0.75 to 0.90
Printing and dyeing	4	3.00	0.50	0.75 to 2.40	0.75	0.35	....
Paper	2	2.00	.....	0.60 to 0.90	.....	....	0.40
Shoyu Brewing	1	1.75	0.45	0.95	0.65	0.38	....
Brushes	3	.....	.....	1.25	2.00	....	0.75
Coal mining	2	.....	.....	1.15 to 1.30	.....	....	....

[1] These figures were obtained by personal interview at the 59 factories listed, in the period from June to October, 1926. Wages have been converted to American currency.

pays, on the average, about 40 to 50 cents a day per girl worker. The equivalent wage per female worker in the cotton industry of the United States averaged in 1926 from $2.09 to $4 a 10-hour day, or between five and eight times the Japanese wage.

The men in the Japanese cotton factories perform only the heavier and more highly skilled jobs. The bulk of the work is done by the women. A man qualified for a job in a cotton spinning mill could expect to earn from 75 cents to $1 a day. The average male wage, including an allowance for the bonus grants, amounted in April, 1926, to 78 cents a day. In the United States, the male cotton mill worker in 1926 averaged from $2.65 to $4.68 for a 10-hour day, according to the part of the country in which the mill was located.

In the raw silk industry in Japan, the working day is 11 hours and the ordinary girl may expect to earn in that time about 60 cents. Beginners start as low as 12½ cents a day and the highly skilled operatives may earn $1.30 a day. The average wage per female operative was about 35 cents a day in 1926.

In the heavier trades, the women workers earn a little more or less than in the textile trades, according to the skill required. In the making of electrical appliances, for instance, they may earn about 60 cents a day by performing operations that require considerable dexterity. In the engineering trades, men can make higher wages than in the textile industries. The work is heavier and requires much more skill and training. In ordinary engineering work, men's wages run between $1.50 and $2 a day for 8 or 9 hours of labor though the very skilled may earn as much as $6 a day. The average wage cost per male worker over sixteen years of age in April, 1926, varied in the engineering and machine industries from $1.25 to $2.11 a day.

Wages vary from season to season, and actual wages now differ from those of 1926, but the changes have not been great. The Japanese Department of Commerce and Industry index of wages in the 13 principal cities of the Empire indicates only small changes in wage levels in the past few years. The year 1926 was chosen because it was the year in which the author was able to gather wage data through personal investigation.

For all ordinary purposes, Japanese wages may be said to range from 30 to 80 cents a day for women, and from 50 cents to $2 a day for men. The significance of those figures lies, for the workman, in their relation to the cost of living, and for the employer, in their relation to total labor costs. In most Japanese mills, the wage is only a part of the direct labor costs. The workers receive additional reward in the form of free lodging, food at below cost, clothing or other necessities. Even the most modern Japanese factories are not free from the old feudal custom of boarding and lodging the help.

In the textile industries, 61 per cent of the workers live in dormitories maintained for the most part by their employers. They receive, in addition to their wages, free lodging, board at less than cost, and sometimes clothing and other items at reduced rates. Those who do not live in the factory dormitories often receive an allowance for food, or they can buy their rice at cost from the company or clothing at reduced rates. In the other industries, the dormitory system is not so prevalent. In engineering, less than 4 per cent of the workers live in company dormitories. In the chemical industries, 9 per cent are housed, and in foodstuffs, 34 per cent. Of all the workers under the Factory Act, 42 per cent receive, in addition to their wages, free or partially free lodging from their employers.[1]

In an investigation by the government Bureau of Statistics in October, 1924, including 74 per cent of all the factory workers and covering 7,000 factories of from 54 to 227 workers but excluding the larger textile mills, it was found that 46 per cent of the factories provided board and lodging, 25 per cent provided clothing, and 3 per cent paid rice to their employees in addition to their wages. Others provided either board only or lodging only.[2]

Men are housed or boarded to a much less extent than are women. Some companies provide houses at low rental for married employees, and some provide dormitories for their unmarried male workers; but generally the men and boys are not housed, except in cases where the plant is located away from the centers of population, or in the mining industry. They do, however, in many cases, receive some form of indirect wage or a higher money wage to equalize their compensation.

In the refining of metals and in mining, both male and female workers are generally lodged at low rentals in company towns. In other industries, it depends on the location of the plant, and no general rule can be applied, though there is less "welfare" in the engineering industries and industries in which men are used primarily than in industries dependent on cheap female labor or located away from easy reach by city populations.

The large percentage of Japanese workers in one way or another can count on something more than the daily wage to meet living expenses; and the Japanese employer must count on paying out, in addition to the daily wages of his employees, considerable sums in the form of board or lodging for the full reward of his workers.

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[1] *Industrial and Labour Information, op. cit.*, Vol. 20, No. 11, p. 48, Dec. 3, 1926; HARADA, *op. cit.*, p. 121.

[2] *Industrial and Labour Information, op. cit.*, Vol. 22, No. 4, p. 153, Apr. 25, 1927.

Wages in Relation to the Cost of Living

The country girl who comes to the cotton mill, a raw recruit from the farm, receives 30 cents a day as wage, and in addition, her lodging at the company dormitories, free or partially free. Her food in the mill dining hall costs her about 9 cents a day,[1] which though less than its cost to the company, amounts to about 36 per cent of her income. The daily wage of 30 cents is paid only for her working days. For the rest days and holidays and sick days, she receives no pay, but food costs are deducted from her pay for each of the 365 days of the year. Thus she has only about 16 cents[2] a day for the rest of her living expenses, her clothing, the payments on the loan to her parents or on the advance of car fare, or the accumulation of the marriage dowry. Sixteen cents a day does not provide her with an extravagant living. A large part of the experienced girl workers earn 60 cents a day, but when the cost of food has been deducted from their pay, their income amounts to but 41 cents a day or $150 a year. It is not much, even to a country girl, especially when she is in debt and must clothe herself and meet sundry other expenses. The men workers in the textile mills get a little higher wage, but they feed and lodge themselves, and often they have a family to support.

In the engineering trades where the wages are generally higher and less is done for the worker as indirect reward, the individual wage is also low in reference to the cost of living. If 15 cents is taken as the daily cost of food for one worker—and that is about what the large textile mills allow in their budgets—the man who earns $1 a day for each day of labor uses 17 per cent of his income just to keep himself in food. A wage of $1 a day amounts to about 88 cents a day in income,[3] and 15 cents is not such a trifling sum in such a budget. If he has but a single dependent, there is only 58 cents a day, after both have been fed, to provide lodging and clothing, medicine and amusement, and all the other necessaries of life. The more skilled worker can earn $2 a day, but the number in this class is not large. The greater part of the labor force of Japan is being paid on the lower level of wages, largely because so much of it is unskilled and untrained—raw agricultural labor with little industrial experience. The low level of the average wages published in the government reports on wages is influenced by this fact. There is no denying the cheapness of the individual worker in Japan. The question at issue is not, "Are wages low," but, "Is the collective cost of labor low?"

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[1] Estimate given by officers of several mills investigated.

[2] Estimate based on 52 rest days and 7 holidays, a working year of 306 days.

[3] On the basis of 325 working days in a year, the number of rest days in engineering being less than the number in cotton mills.

LABOR COSTS

Under the dormitory system, all the needs of the worker are supplied under the supervision of the company. Besides board and lodging, if the girl has not completed her compulsory education requirements, and many of them have not, education is given by company teachers. Since the workers are locked behind the factory gates for their own and the company's good, they must make all their purchases at company stores; patronize company hairdressers, an important part of the Japanese girl's toilet; bathe at the company baths; be attended by the company doctor; in fact, supply all their necessities and pleasures from company sources. For the most of these things, the workers pay in full, but the organization is provided by the company, and it constitutes a heavy and unwieldy overhead expenditure that must go on whether business is good or bad and cannot be contracted except after considerable delay and probably some loss.

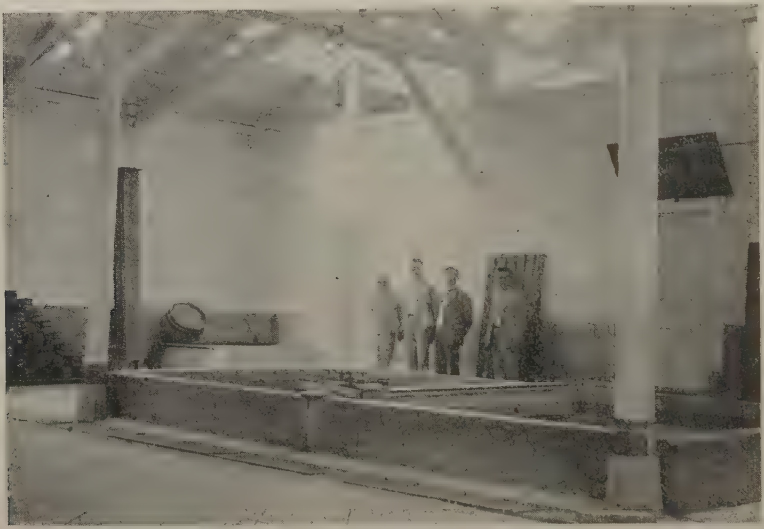

FIG. 113.—Bath-houses must be provided in the dormitories for the mill workers. The large community tub is quite in keeping with the Japanese custom.

The Kanegafuchi Spinning Company, one of the largest textile companies in the country and one which provides a complete mill village within the gates of each factory, published in 1919 some figures of its expenditures for welfare. The amount for dormitories was $110,000, for hospitals and sanitation $131,000, for welfare accommodations $142,000, and for loss on meals served at below cost $434,000, or a total of $817,000 for the half year. The payroll of the company for the half year would probably amount to about $3,250,000,[1] making the amount spent in additional payments for labor about 25 per cent of the payroll.

The Japan Cotton Spinners' Association estimated the cost of lodging and medical care in a cotton mill to be about 11 cents a day per operative in 1919, and in addition 10 to 15 cents a day per operative would be spent for food. The entire cost of maintenance was estimated at from one-fifth to one-half of the operative's wage, but generally at one-third.[2] Two mills cited by H. C. Chalmers in his report to the Tariff Commission in 1921, gave as the cost of providing board and lodging for their workers between 42 and 43 per cent of the direct wage.[3]

FIG. 114.—The garden and dormitories of an Osaka cotton mill.

Disadvantages of the Dormitory System

The dormitory system has tremendous advantages for the manufacturer. By this means, he is certain of his labor force from day to day, and absenteeism and lateness are under check. It permits him practically to double his capital by operating the machinery night and day. The leisure, as well as the working hours of the employees, are under his control. Labor unionism is barred out; strikes are difficult to call. There is opportunity, if he cares to use it, for vast industrial experiments with labor.

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[1] Estimate based on data in The Kanegafuchi Spinning Company, Ltd., Its Constitution and How It Cares for Its Employees and Workers, October, 1919; and Financial and Economic Annual, *op. cit.*, 1921. The number of workers in the Kanegafuchi mills in 1919 totaled 8,300 males and 32,783 females. The average wage for male operatives in the cotton spinning industry according to government figures for 1919 was $0.65 a day, for females $0.475 a day. The average number of days worked in the half year was 155.

[2] Cotton Mills and Workers in Modern Japan, *op. cit.*, p. 17.

[3] The Japanese Cotton Industry and Trade, *op. cit.*, p. 107.

But the dormitory system is also a two-edged weapon. It is a breeder of discontent and labor turnover. It smacks of being a prison. The workers chaff under their restricted freedom; they rebel against the institutional food. Every labor union in the country has marked the dormitory system for attack. Every strike among the workers foments about the restrictions of freedom and the poor quality of food.

Some of the dormitories are quite pleasant places, except that they are all under the shadow of their factories. They are clean and airy and they have small gardens about them, careful sanitation according to Japanese standards, and various social features. But some are not well kept. Too many girls are crowded together into one room for sleeping quarters. The night and day shifts share the same quarters, the same bedding. This is not often true, but it does happen. Sanitation is careless. The food is bad, or if not bad, unpalatable.

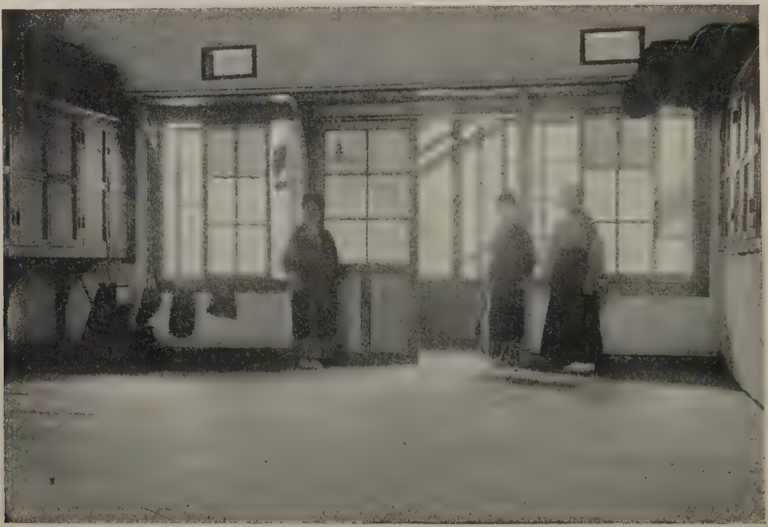

FIG. 115.—Eight to ten factory girls share this room in the dormitory of a large cotton spinning mill.

In the best factories, the food is a source of dissatisfaction and unrest. The usual meal consists chiefly of rice, potatoes, daikon (a kind of pickled radish) and tea. One company described the menu of its domiciled employees as follows:

> The boiled rice is served in large casks, and there is no limit set as to the quantity to which any one can freely help himself. Food other than rice is generally served in dishes, and four times a month it is provided

without limit. Besides the food above stated, a bean soup, pickles, preserved plums, boiled beans and peas are provided free of charge.[1]

There is generally no lack in the quantity served, but the diet is badly balanced. It has too much starch and too little protein and roughage, and there is little variation. The workers weary from a day of 10 or 11 hours' labor often leave much of the food untouched.[2] Dr. Tadasu Saiki, the Director of the Government Institute for Research of Nutritious Food, has made an investigation of the meals served in the dormitories of factories in Ehime Prefecture. According to him, women operatives at the age of about twenty years require from 60 to 70 grams of protein and from 2,000 to 2,200 calories a day. In his investigation of 166 factories, he found but five that were serving food containing more than 60 grams of protein. The rest were all under the standard, and the number of calories was proportionately low. Sixty-five of the factories were providing but 30 or 40 grams of protein, 91 provided 40 to 50, and 45 provided 50 to 60 grams. According to other researches made by Dr. Saikai, a balanced diet could be served at no increase in cost to the management.[3]

An investigation into the physical condition of operatives living in factory dormitories in Tokyo City in May, 1930, made by the metropolitan police with the assistance of diet experts, disclosed the fact that a large number of the occupants of factory dormitories are badly undernourished. The police and the experts pointed out to the factory management that it was often not so much a question of the quality of the food served as the lack of variety in the menus that led to the undernourishment of the operatives. One large factory dormitory, it was said, served *miso-shiru* (a bean soup) and pickles at breakfast, salted salmon at dinner, and *miso-shiru* and pickles at supper; and the same menu had been served for years.[4]

Labor unionism is gradually getting inside the factory gates, and domiciled workers on strike are a distinct liability. Social agencies besides the labor unions are agitating against the abuses of the dormitory system. The press has given the textile industry unwanted publicity in several food and sanitation scandals. There have been cases of poisoned food, unhealthy sanitation, crowded sleeping quarters. The abuse and the agitation have been sufficient to cause the government to take action. Regulations on sanitation in dormitories, the size and occupancy of bedrooms, separate accommodations for separate shifts, etc. were put in force in May, 1927.[1] The labor movement demands complete abolition or radical reform of the dormitory system. It seems likely that the dormitory system will be a problem so long as it exists and that the manufacturers will be forced to make important changes in the housing of employees.

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[1] The Kanegafuchi Spinning Company, Ltd., *op. cit.*

[2] Observations made during personal investigation in mills, corroborated by members of a woman's investigation committee of the Japanese Association for International Labour Legislation.

[3] *Trans-Pacific, op. cit.*, Apr. 4, 1929, p. 23.

[4] *Trans-Pacific, op. cit.*, p. 15, May 22, 1930.

The disadvantages in the system may, in fact, outweigh the advantages. Following a dispute with the Japanese Cotton Spinners' Trade Union, The Kameido factory of the Oriental Muslin Company accepted the workers' demands for the removal of restrictions on freedom, and the girls were permitted to go out freely from June, 1926. One year's experience proved these women to be capable of taking care of themselves and there resulted fewer cases of moral discipline; the number of women going out or stopping out of dormitories diminished and the efficiency of their work increased. The company was so satisfied with the results that it planned to remove the dormitories from within the factory gates and construct new ones in the suburbs.[2]

Discharge Allowances

There is another labor cost for Japanese manufacturers that is not generally met with in other lands. It is the discharge allowance that the worker expects whatever the cause of his dismissal. Curiously enough, there seems to be a somewhat general recognition of industry's responsibility to the worker for his job and the worker's right to indemnity for the loss of that job. The Factory Act of 1923 requires 14 days' notice of discharge or 14 days' pay, but this practice is quite outside the provisions of that act. It is undoubtedly a relic in modern industry of the industrial code of the feudal household industry of old Japan. There is no fixed amount or uniform practice, and it is impossible to estimate how much the discharge allowance adds to the cost of labor. The amount varies from year to year, from one mill to the next, and from one worker to another; but it becomes at times a considerable sum.

Following the financial depression of 1927, the Kawasaki Dockyard in Kobe was forced to let out 3,000 men because of financial difficulties in the company. The dismissed men were paid a total of $250,000 in discharge allowances,[3] or an average of $83 each. In December of the same year, the Imperial Steel Works at Yawata, Kyushu, let out 700 men to whom it paid $458,000 in discharge allowances in addition to the usual year-end bonus. The highest individual discharge allowance in this case amounted to $2,000, the lowest to $65, and the average to $690.[1]

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[1] *Industrial and Labour Information, op. cit.*, Vol. 22, No. 7, p. 356, May 30, 1927.
[2] *Op. cit.*, Vol. 23, No. 11, Sept. 12, 1927.
[3] *Trans-Pacific, op. cit.*, July 30, 1927.

Even in the case of strikes, dismissal allowances are paid to workers. In June, 1927, the Dai Nippon Spinning Company was involved in a strike of 3,000 of its operatives. The strike lasted 40 days and was finally ended with a signed agreement by the company in which were promised:

1. Better treatment of operatives including better food and more freedom;
2. Some money allowance to returning strikers considering their condition during the strike;
3. No further dismissals for participation in the disturbance;
4. The payment of $10,900 as dismissal allowance to 88 workers discharged because of their strike activities.[2]

The famous strike of the Noda Shoyu Brewing Company in 1927 and 1928 lasted 217 days, the longest strike in the history of Japanese labor, and there was much bitterness on both sides. It was finally lost by the strikers, but the company paid $190,000 as discharge allowances to the dismissed strikers. The number of strikers dismissed in the course of the strike was 1,047. Of these, 300 were reinstated and the remaining 747 were given more than $200 each on the termination of the strike. The rest of the sum, about $40,000, was to go to the strike fund of the union though the company refused to recognize that union.[3] Despite the indemnities and the payments to the union, Japanese labor considered the strike lost and had no feeling of victory. An American union able to force such terms from an employer at the termination of an unsuccessful strike would at least claim that a moral victory had been won for the principle of industry's obligation to the worker.

In the Hamamatsu strike of 1926, the Japan Musical Instrument Company paid $19,000 as dismissal allowances to the strikers. In the Toyo Muslin strike in August of the same year, the company agreed to pay $300, in addition to the regular dismissal allowance, to each of the eight discharged leaders of the strike. In a strike of 4,500 employees of the Yokohama Dockyard Company in March, 1929, the conditions of settlement included a system of dismissal allowances that provides a worker dismissed after one year's service with an allowance corresponding to 30 days' wages, the amount to be increased by 8 days' wages for each additional year up to 10 years of service. From 11 to 20 years' service, the dismissal allowance is to be increased by 10 days' wage for each additional year; and after 20 years the increase is 12 days' wage for each additional year of service. The company also agreed to pay a certain amount of money to the families of strikers but refused to shoulder the total of the strike expenses.[1]

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[1] *Trans-Pacific, op. cit.*, Dec. 17, 1927.

[2] *Trans-Pacific, op. cit.*, July 23, 1927.

[3] *Trans-Pacific, op. cit.*, Apr. 28, 1928.

PATERNALISM IN JAPANESE INDUSTRY

There is a strain of paternalism running through all Japanese industry that is as distinctly a part of the new industrial system as of the old. It is the Japanese way of thinking, and it is responsible for the feudal character of labor relations in modern industries, for the dormitory system, the semiannual bonus, the food and rent subsidies, the discharge allowance. Japanese employers are loath to discharge their workers in times of depression. It may be because the financial penalty involved acts as a stimulus against frequent discharges, or it may be that the employers can depend upon the rapid turnover to reduce their force to the requirements of business; or they may hold on to their workers in bad times because of the difficulty of recruiting them back again when business recovers; but it is also probable that their reluctance to discharge their workmen is due to a feeling of responsibility, a survival of the paternalism of the master craftsman. The low wages of the workers make them dependent upon the employer. He is not quite free to give them abrupt notice of dismissal.

In the depression of 1930, the Kanegafuchi Spinning Company, which is famous for its welfare work and one of the most paternalistic of the modern companies in Japan, decided to reduce its allowance to workers by 23 per cent rather than reduce the working force, in order to tide the company over the difficult period of business. The workers resented the cut, especially because the company has consistently paid dividends of 35 per cent and recently paid the sum of 3,000,000 yen ($1,500,000) as a bonus to its retiring president. The various mills of the company immediately went on strike, and a good deal of disturbance resulted. The management insisted that the strike constituted a threat against the principle of paternalism upon which Japanese industry has always been built. They promised the workers to take care of them in their own way if they abandoned their strikes and demands, and asked each operative to sign the following pledge:

> As I recognize the spirit of paternalism, which is the basis on which the Kanegafuchi Spinning Company is operated, and trust that the company will guarantee the stability of our livelihood, I will refrain from joining in any agitation and go quietly about my work. I give my solemn oath and sign this statement for future reference.[2]

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[1] Records of these cases were reported in the *Japan Advertiser*, *op. cit.*, Aug. 9, 1926; Sept. 17, 1926; and in the *Trans-Pacific*, *op. cit.*, Mar. 28, 1929.

[2] *Trans-Pacific*, *op. cit.*, Apr. 17, 1930.

The Japanese employer must pay for his cheap wages in many ways. If, as is estimated, the semiannual bonus adds from 5 to 30 per cent to the direct wage, and the labor turnover and recruiting system add another 8 to 12 per cent, and the dormitory system with all its adjuncts puts on 20 to 50 per cent more, and discharge allowances together with the alternative cost of maintaining a full force in times of depression add an unknown additional amount to the labor costs, the cheap Japanese labor must cost somewhere from 33 to 92 per cent more than is apparent in the money wage (see Table XXXV at end of Chapter XX).

The data for these estimates are admittedly incomplete, but it is probable that the lower limit of 33 per cent is no exaggeration of the extra costs. How much more the labor costs of the Japanese employer are, it is difficult to say. The range of the estimates is too wide to mean anything except that very little is really known about the problem as a whole, even by manufacturers. All that can be safely said of the cost of the cheap wage system is that it is greater than is immediately apparent, and probably by a considerable amount. In estimating the cost of Japanese labor, a consideration even more important than the items discussed in the present chapter is its efficiency in comparison with the labor of other manufacturing countries.

CHAPTER XX

THE EFFICIENCY OF LABOR

A MOST important weakness of the Japanese industrial system is the inefficiency of the labor. Japanese factories are crowded with workers and it is evident, even to the casual observer, that many are employed for a task that might be performed readily by one. The output per worker is small.

THE EFFECT OF LOW WAGES

Labor is apparently cheap and its efficiency is disregarded. Capital is scarce and machinery is costly. It is introduced sparingly and the mill owner endeavors to get the utmost out of his mechanical equipment. It is operated at top speed. It is run day and night and is kept in use even after it is out of date. Output is considered in terms of the machine and not in terms of the worker. To insure the operation of the machinery on full time and at top speed, an extra reserve force of labor, ranging from 10 to 30 per cent of the actual working force, is kept on the payrolls of cotton mills.[1] Any deficiencies of the machine are met by the addition of more labor. With a daily wage of, say 60 cents, there is little incentive to economize or to improve the output of the workers.

The low wages, perhaps more than any other single factor, have contributed to the inefficiency of Japanese labor and have thus added to labor costs. They have started an economic snowball that cumulates as it rolls. They have discouraged the introduction of modern machinery and of efficiency methods and have permitted the employment of an excessive number of workers. The larger labor force requires a larger supervisory force and a larger clerical staff. It makes necessary a larger outlay for dormitories and for the other services that must be supplied to the Japanese workers. With the realization that low wages do not necessarily make for low labor costs, there may come a change in the Japanese labor policy and factory organization as revolutionary as the change from the spinning wheel to the spinning frame.

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[1] The Japanese Cotton Industry and Trade, *op. cit.*

THE EFFECT OF LONG HOURS

The long working hours are also responsible in part for the inefficiency of Japanese labor. The hours and the low wages have much the same background. The domestic workshop depended upon apprentices or very poorly paid workers, and a very long working day was the accepted custom. A day of 14, 16, or even 18 hours was usual for apprentices. They may still be seen at their tasks at ten o'clock at night in the shops of master tailors, cabinet makers, and other craftsmen of the old order. In busy seasons, they will often work till midnight.

Partly because of this background and partly because of the scarcity of capital for the purchase of machinery, but probably more because of the belief that long hours make for lower labor costs, the hours of labor in modern industries in Japan, though not as long as in the domestic workshops, do not conform with the general practice of western nations. Up to the present, much of the pressure for their reduction has come from outside the country, either through international conferences or through the ideas of western working conditions and labor union standards introduced by Japanese intellectuals and labor leaders who have studied abroad. The international standards established at the Washington Hours Conference in 1919 have had a strong influence on Japanese standards.

A census of working hours in factories was taken by the government in October, 1924, and according to the findings, 45 per cent of the factory employees were working more than 10 hours a day. In the textile industries, where half the factory workers are employed, 75 per cent of the operatives had a working day of more than 10 hours, and 31 per cent were employed between 11 and 12 hours a day. In the engineering industries, employing less than 20 per cent of the workers, the working day was between 8 and 9 hours (see Table XXXI).

The factory law as amended in 1923 came into effect in 1926 and reduced the working hours for women and young persons under 16 years of age from 12 or 14 hours a day to 10 or 11. The general principle established was for 10 hours of labor and 11 hours attendance, but exceptions were permitted for the textile industries until August, 1931. In the manufacture of raw silk and silk fabric for export, and in cotton spinning, the factories are permitted to work 11 hours a day, provided there is no night work. That means that more than half of the specially protected group—the women and the young persons under sixteen—do not receive the full protection of the 10-hour law until August, 1931.[1]

In actual practice, the raw silk filatures do not depend on night work, and the usual working day is 11 hours of labor, 12 hours attendance. The cotton spinning mills are mostly organized on a two shift basis of day and night work, and the working day and night before the abolition of midnight labor on July 1, 1929, were 10 hours of labor, 11 hours attendance. Since the abolition of midnight work, most of the mills have adopted a system of two shifts of 8½ hours each. The large concerns in the heavy industries, employing mostly men, are organized in general on an 8 or 9-hour day, but most factories employ their labor for more than 9 hours a day and the average for all industries in 1927 was 10¼ hours.

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[1] Estimated from data in Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

TABLE XXXI.—HOURS OF WORK PER DAY IN JAPANESE FACTORIES IN 1924, SHOWING THE PERCENTAGE OF WORKERS AFFECTED[1]

Industry	Total number of workers	Percentage of operatives working					
		Less than 8 hours	8 to 9 hours	9 to 10 hours	10 to 11 hours	11 to 12 hours	12 to 14 hours
Ceramic	49,990	14.4	40.2	34.8	9.7	0.7	0.2
Metals	74,088	19.0	55.8	16.8	7.9	0.4	0.1
Machine and tools	202,996	24.5	63.8	11.0	0.5	0.1	0.1
Chemicals	58,241	16.3	40.2	29.1	13.8	0.6	...
Textiles	735,713	0.2	1.4	25.1	41.1	30.6	1.6
Paper	27,812	4.4	5.6	19.9	68.8	1.3	...
Food	69,162	11.4	71.5	9.8	6.8	0.5	...
Clothing	25,770	5.9	46.3	33.5	13.3	0.8	0.2
Printing and binding	32,789	27.1	20.1	51.2	0.5	1.0	0.1
Other industries	49,728	9.8	46.1	29.5	12.3	2.2	0.1
	1,326,289	8.1	23.9	23.0	26.8	17.3	0.9

While the western nations, and in particular the cotton factories of the southern United States, do not keep faithfully to the international standard of the 8-hour day and the 48-hour week, the general practice enforced by the labor unions is much nearer that standard than in Japan. Not only is the working day of Japanese labor longer, but the work week of 6 and sometimes 7 days is longer than the western practice. Since Sunday has no religious significance for the Japanese, the worker does not automatically have his Sundays as a day of rest. Rest days vary from 2 to 4 a month. The law provides for 2 rest days a month for women and young persons under sixteen, but there is no legal provision for the rest days and working hours of adult males.

In the cotton spinning factories before the abolition of midnight work, 4 rest days a month were required by law. With the abolition of midnight labor, the factories have returned to the practice of 2 rest days a month. In raw silk filatures where there has never been continuous day and night work, the rest days have generally been 2 a month. For the cotton spinning industry under the old system, the work week for the individual was 60 hours and under the new system it is 51 to 59½ hours. For raw silk, it is 66 hours some weeks and 77 other weeks or an average of 71½ hours a week. It is a far cry from the 5-day, 40-hour week of some American workers. In other Japanese industries, the work week ranges from 48 to 84 hours, but in very few is the 48-hour week the rule.[1]

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[1] Computed from the official Census of labor of October, 1924, as quoted in HARADA, *op. cit.*, p. 410; and Résumé Statistique, *op. cit.*, 1928, p. 108.

Night Work for Women and Children

In its effect upon the efficiency of labor, the employment of women and children on night work has been much the same as the long hours. The practice, in so far as it concerned the labor of women and young persons under sixteen years of age between the hours of 11 p.m. and 5 a.m., was finally abolished by law on July 1, 1929. Night work, except in continuous industries, generally has not been practiced in industries other than cotton spinning and the spinning of other fibers. The scarcity of capital for industrial undertakings and the comparatively large amount of investment necessary to the importation and installation of spinning machinery from abroad led to the policy of running what machinery there was continuously, and of working the labor force in two shifts from 6 a.m. to 5 p.m. and from 6 p.m. to 5 a.m., in order to get the maximum out of the capital investment. Where the investment in machinery has not been large, there is generally no night work unless the operation requires it.

The use of women and children on night work in Japanese mills has been the subject of a good deal of international wrangling. Although the abolition of midnight labor for women and young persons under sixteen was accepted in principle at the Washington Hours Conference in 1919 and was embodied in the Factory Act of 1923, the government was reluctant to force the industries to accept the curtailment of working hours, and put off the enforcement of the convention for 10 years. Even now, the law is not entirely in accordance with the international convention. The age limit of young persons engaged in industry is lower in Japan, and the limit of day work ends at 11 p.m., instead of 10 p.m., with fewer rest days in the week. The government and employer delegates to the Washington Hours Conference contended that it would be unfair to force the abolition of night work upon the spinning factories until they had the opportunity to offset the curtailment of working hours and production by an increase of machinery. It was for this reason, presumably, that the government waited so long to enforce the law. But it seems doubtful if their reluctance was well-founded. It is altogether questionable if the curtailment of working hours suggested would reduce production to any such degree, or that it would be a hardship on the industry if a lower production resulted.

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[1] Based on personal investigation of many mills.

The abolition of night work between 11 p.m. and 5 a.m. reduced the working day for the machinery from 20 hours to 17, or an amount equal to 15 per cent, but the number of rest days for operatives and machinery was also reduced from 4 days and nights to 2 days and nights a month. Thus the work week for the machinery averages 110½ hours instead of 120 hours, and the actual curtailment due to the abolition of midnight work was less than 8 per cent.

Between the Washington Hours Conference in 1919 and July 1, 1929, the Japanese manufacturers added and installed a total of nearly 2,500,000 spindles for the cotton industry, an increase equivalent to eight times the number needed to offset the reduction in output. Enough new spindles had been added to the industry by 1924 to offset the 20 per cent reduction that would result from a full and complete adoption of the Washington Night Work Convention without reducing the number of rest days for the operatives.[1]

Moreover, from May, 1927, to June, 1929, the industry was under voluntary agreement to restrict production. Following the panic of early 1927, the Japan Cotton Spinners' Association agreed among themselves to reduce output by sealing 15 per cent of the machinery in order to protect the industry from overproduction. The next November the ratio of production curtailment was increased to 23 per cent, and in September, 1928, it was decided to continue the same ratio of restriction until July 1, 1929, the date set for the abolition of midnight work. Due to various exceptions, the restriction ratio worked out at 18.5 per cent of the spindle capacity. Thus, without adding a single new spindle to the industry after May, 1927, the Japanese cotton spinners could have unsealed enough machinery to offset more than twice the actual reduction of their producing capacity due to the abolition of midnight work.

Between May, 1927, and July, 1929, the Japanese cotton spinning mills purchased new machinery, adding 7.4 per cent to their spindle capacity, which, with the removal of the restrictions on output on July 1, 1929, amounted to an addition of 26 per cent to the productive capacity with which to meet a curtailment of 8 per cent in working hours. The productive capacity of the industry without benefit of midnight labor was, in 1929, at least 64 per cent above the 1919 level,[2] and in 1930 it was found necessary to restrict production by 27 per cent. Aside from the question of efficiency, it would appear that the industry might benefit rather than lose by the abolition of midnight labor.

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[1] Based on data in Mitsubishi *Monthly Circular*, *op. cit.*, Nov., 1928; Economic Statistics of Japan, *op. cit.*, 1925–1927; and *Trans-Pacific*, *op. cit.*, July 4, 1929.

[2] *Op. cit.*

THE RELATIVE EFFICIENCY OF THE JAPANESE WORKER

In order to arrive at some measure of the relative efficiency of the labor in Japanese cotton mills and of labor costs, comparison has been made with some of the mills in the southern United States whose product is more nearly comparable to the Japanese. The labor situation in the United States is the reverse of that prevailing in Japan. Wages are comparatively high and there is an effort to use labor economically. To increase the output of the individual worker, machinery has been introduced wherever possible. The American cotton industry has by no means reached the ideal of efficiency, but it may serve as a basis of comparison with the Japanese industry.

Certain differences in the industries of the two countries are important and must be noted. The raw material is essentially different. Though the Japanese do use some American raw cotton, the bulk of their cotton is from India and is of shorter staple, more likely to breakage and waste and requiring more labor to put it through the machinery. The yarn spun has more of the coarser counts that require more labor. Much of the spinning machinery is old, out of date, not constructed or arranged for the maximum efficiency of the employee. By adding more labor, it is run somewhat faster than American practice. But except for the raw material, and that too in part, all of these factors are in some way related to the cheap labor policy of the management. They are there because the labor is cheap. The comparisons that follow are made on the basis of the 10-hour day in the Japanese mills before the abolition of midnight work.

Efficiency in Cotton Spinning

A competent spinner in Japan, working on 20 count yarn, operates from 300 to 400 spindles. On the same count yarn, an American spinner will tend from 1,020 to 2,688 spindles, or 2½ to 6¾ times as many. On 30 count yarn, the Japanese spinner will generally have no more than 450 spindles though a very skilful worker will have 600 to tend. On the same yarn, the records of six American factories showed the average number of spindles per spinner at, respectively, 750, 1,056, 1,120, 1,344, 2,500 and 2,688, anywhere from two to six times the Japanese average. The wages of American spinners average from 4½

TABLE

COMPARISON OF WAGE COSTS AND THE EFFICIENCY
JAPAN AND SOUTHERN

United States					
Average count of yarn	Operatives per 1,000 spindles	Output per spindle per 10-hour day, pounds	Output per operative per 10-hour day, pounds	Average wage per 10-hour day	Wage cost per pound of yarn
14	9.3	.65	70	$2.44	$ .035
14.5	6.8	.51	76	2.44	.032
17	8	.42	52	2.44	.047
17	9	.62	69	2.44	.035
17.5	7	.43	60	2.44	.041
18	7	.40	56	2.44	.044
19	8	.45	56	2.44	.044
23.7	7	.31	46	2.44	.053
34.3	3	.17		2.44	.038

[1] Based on data obtained from the report of the Japan Cotton Spinners' Association, March, 1925; and correspondence with 18 American spinning mills, 2 trade associations, a national labor union, and state and national government bureaus. The average wage used for American mills is based on data in U. S. Bureau of Labor Statistics, Bulletin 446, Wages

to 5⅓ times the wages of the Japanese spinners.[1] Does the difference in the wage fully offset the difference in output, especially in view of the fact that the Japanese are able to operate the machinery at a greater speed than the Americans?

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[1] The hourly wage for spinners on 20 and 30 count yarn in southern mills is from 17 to 38 cents, for Japanese spinners on the same count yarns it is about 5½ cents. Data obtained from personal investigation of Japanese and American mills.

XXXII
OF LABOR IN COTTON SPINNING MILLS
UNITED STATES[1]

Japan					
Average count of yarn	Operatives per 1,000 spindles	Output per spindle per 10-hour day, pounds	Output per operative per 10-hour day, pounds	Average wage per 10-hour day	Wage cost per pound of yarn
13.2	17	.71	40.8	$ .70	$ .017
14.8	19	.68	36.5	.62	.017
15.9	24	.45	18.8	.57	.030
17	22	.53	24.2	.65	.027
17.2	14	.47	34.0	.63	.019
17.2	10	.48	22.4	.58	.026
17.3	29	.38	13.0	.60	.046
17.6	24	.54	22.2	.59	.027
18.3	22	.55	24.6	.79	.032
19	21	.53	25.1	.68	.027
19.3	9	.20	22.1	.62	.028
19.3	19	.48	24.6	.64	.026
19.7	21	.45	21.4	.69	.032
19.7	20	.37	18.8	.62	.033
23.1	16	.31	19.1	.52	.027
23.2	15	.28	18.3	.79	.043
23.7	19	.42	22.1	.62	.028
23.7	15	.28	18.4	.55	.030
32.1	16	.24	18.3	.53	.029
32.2	19	.32	16.8	.73	.043
33.7	17	.24	13.5	.71	.053
35.6	17	.21	11.5	.57	.049
36	17	.22	12.8	.56	.044

and Hours of Labor in Cotton-Goods Manufacturing 1910–1926, and is the average of the earnings of the principal occupations in spinning mills in North Carolina, South Carolina, and Georgia for 1926. The data presented are for individual companies in Japan and individual mills in North Carolina, South Carolina, and Georgia.

In order to make a fairer comparison, it is necessary to measure the performance of the entire force of operatives, not of the spinners alone. There are differences in the production methods that make comparisons for specific operations not entirely safe. The doubling up of labor occurs all along the line, in every operation in Japanese mills. The more accurate basis of comparison is the output per operative per given unit of time for the same grade of product.

Data for this comparison have been secured from cotton spinning mills in North Carolina, South Carolina, and Georgia, where the product is more nearly comparable to the Japanese product, and from the printed report of the Japan Cotton Spinners' Association for March, 1925. The details are given in Table XXXII. The Japanese figures are for individual companies, the American for individual mills. The basis of comparison is the average count spun. It is not an ideal basis, for the average count of yarn is, like all other averages, an unreliable index of the character of the product. Data are not available for more exact comparison but this basis will serve in pointing out the essential differences in efficiency.

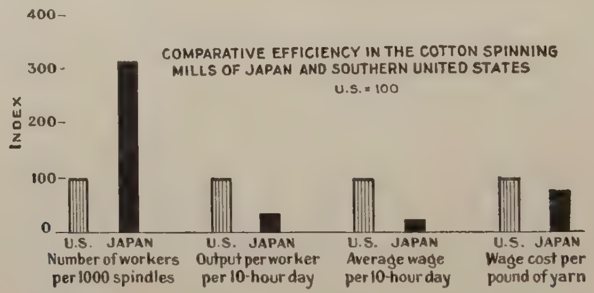

FIG. 116.—Due to the use of greater numbers of workers in Japanese spinning mills, the lower individual wage is almost equalized through the greater output per worker in America.[1]

Some few Japanese spinning mills are organized on a labor basis nearly as efficient as American standards, but the vast majority of the Japanese mills waste labor. They make use of anywhere from 2½ to 5⅔ times as many workers per 1,000 spindles. The average is well over three times the American requirement. While some of this labor is needed for the greater speed of the Japanese machinery, much of it is inefficient. The output of yarn per operative in a southern mill for a 10-hour day is from 2¼ to 4⅓ times the output of yarn per Japanese mill operative for the same number of hours. On the average, nearly three times as much labor is used in Japanese spinning mills as is actually required for the same output in America. It wipes out much of the difference in wages.

The American worker receives a daily wage that is about four times the average Japanese wage for the same length of day. With three times the output and four times the wage, American wage costs per pound of yarn average about 35 per cent greater than the Japanese[2]

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[1] Data from Table XXXII.

[2] This figure is corroborated by Mr. Chalmers in The Japanese Cotton Industry and Trade, 1921, *op. cit.*, p. 114 According to his estimate, American spinners' wage per pound of 20 count yarn produced was 25 per cent greater than the Japanese spinners' wage on the same product.

(see Figure 116). There are American mills that produce yarn at a lower wage cost per pound than Japanese mills making the same grade of product. The range for approximately the same counts is from 200 to 72 per cent of the Japanese wage cost. It is no safe margin for the Japanese to bank on for the future, especially if other labor costs are added. The addition of even 33 per cent, the low estimate of extra labor costs due to bonuses, discharge allowances, dormitories, etc., would reduce the margin of advantage to a very unsafe amount. In the United States, there are also extra labor costs for housing workers in the southern mill towns and for various welfare activities by the employers. Also, the higher costs in Japan, due to the large numbers of workers, are undoubtedly offset somewhat by the interest on the greater amount of capital invested in machinery in the United States, but it is questionable if these additional costs will balance the extra costs of Japanese labor.

The data here presented are admittedly imperfect and wide of range, but they are sufficient to point out certain definite facts about the Japanese cotton spinning industry: The mills are overmanned; the labor is cheap but inefficient to a degree that greatly offsets its cheapness; extra labor costs reduce the margin of advantage still further; and there are some American mills, in spite of an average wage four times as high, that are producing at a lower wage cost per pound of output. These are sufficiently important facts to cause the Japanese industry some concern for the future.

Efficiency in Cotton Weaving

The differences in the efficiency of labor in the weaving mills of the two countries are more startling. For the purposes of this comparison, the spinning of yarn has been divorced from the weaving of cloth, and the spinning mills and weaving mills have been considered separately.

The number of looms a weaver can operate varies tremendously with the width of the loom, the kind of loom, the nature of the cloth, and the system of production. On a plain weave cloth, a Japanese weaver may attend 4 looms of ordinary width, though it is quite usual for the number to be 2. American weavers on similar non-automatic looms making plain weaves will operate 8 to 12 looms. On automatic looms, and they are generally used in the southern states, a weaver will tend anywhere from 16 broad looms to 115 narrow, depending on the system of production. He may care for 30 automatic looms of ordinary width, fill his own batteries and remove the cloth himself, or on the multiple system of production, he may tend from 56 to 70 or even 90 looms, aided by battery fillers and cloth men. The automatic loom

TABLE

COMPARISON OF WAGE COSTS AND THE EFFICIENCY

JAPAN AND

United States						
Average count yarn	Kind of cloth	Number workers per 100 looms	Output per loom per 10-hour day, pounds	Output per worker per 10-hour day, pounds	Average wage per 10-hour day	Wage cost per pound of cloth
14	Sheeting, drills	13	19.3	148	$3.42	$.023
17	Sheeting, gauze	12	20.6	168	3.42	.022
20 and 21	Chambrays	12	12.5	109	3.42	.031
21 and 22	Wide sheeting	6	11.9	185	3.42	.018
27 and 28	Indigo chambray, ginghams	11	8.2	73	3.42	.047
30 and 40	Broadcloth, fancy underwear	9	7.8	88	3.42	.039
30 and 40	Prints, cords	9.5	10.1	97	3.42	.035
36.75	Broadcloth	12	10.3	88	3.42	.039

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[1] Based on data obtained from the report of the Japan Cotton Spinners' Association for December, 1925 (in Japanese); and correspondence with nine weaving mills in North Carolina. The average wage used for American mills is based on data in Wages and Hours

XXXIII

OF LABOR IN COTTON WEAVING MILLS

NORTH CAROLINA[1]

Japan						
Average count yarn	Kind of cloth	Number workers per 100 looms	Output per loom per 10-hour day, pounds	Output per worker per 10-hour day, pounds	Average wage per 10-hour day	Wage cost per pound of cloth
14	Duck, shirting	139	10	14.4	$.77	$.053
14.3	Gray flannel	81	16.8	20.9	.65	.031
14.4	Duck, drill	55	19.1	35.0	.64	.018
14.8	Gray flannel	56	9.8	17.0	.58	.034
16	Coarse white, fine cloth, duck, shirting, drill	68	17.4	25.8	.52	.020
16.5	Gray flannel	80	7.5	18.6	.51	.027
16.8	Coarse white, duck	54	13.6	25.2	.95	.038
18.2	Shirting, duck	137	19.0	13.9	.51	.037
18.7	Imitation nankeens, wide cloth, T-cloth, gray flannel	34	5.5	16.3	.52	.032
19.2	Shirting	58	5.0	8.6	.52	060
20	Imitation nankeens, gray flannel	26	7.1	27.5	.48	.017
20	Drill, duck, rubberized cloth	204	11.4	5.6	.61	.109
21.3	Shirting, fine drill, fine cloth	74	9.2	12.5	.70	.056
21.5	Shirting	66	5.4	8.2	.74	.091
21.9	Cotton drill, T-cloth	77	11.3	14.7	.57	.039
22.4	T-cloth, shirting, drill, flannel, fine cloth, coarse cloth, cotton satin	74	11.9	16.0	.64	.040
22.6	T-cloth, coarse white, drill, fine twill, cotton satin, fine cloth	81	14.0	17.9	.71	.040
27.3	Coarse cloth, shirting, drill, cotton satin	83	11.2	13.6	.74	.054
28.7	Coarse cloth, shirting, fine drill, cotton satin, cotton crepe, fine cloth, lawn, gassed shirting	94	9.5	19.9	.60	.060
28.9	Shirting, drill, fine cloth, calico, miscellaneous	87	8.4	9.6	.70	.073
31.7	Shirting, fine cloth	65	10.4	16.0	.60	.037
33.9	Shirting, fine cloth, cotton satin	68	8.4	12.4	.72	.058
40	Shirting, T-cloth, fine drill	69	6.2	9.0	.64	.071
40	Shirting, drill, lawn	51	8.1	16.1	.51	.032

of Labor in Cotton-Goods Manufacturing, 1910–1926, *op. cit.*, and is the average of the principal occupations in weaving mills in North Carolina for 1926. The data are for individual companies in Japan and individual mills in North Carolina.

makes a vast difference in the number of machines operated by one worker.

Most of the Japanese looms are of the old English type, not greatly superior to the hand looms that still are able to function in the farm houses all over Japan in competition with the power loom. The installation of the automatic loom was begun only recently. Cheap labor has retarded its adoption.

An American mill can operate with from 6 to 13 or 15 operatives per 100 looms. A Japanese mill requires 50, 60, 70, 80, and 90 operatives to the 100 looms. The range of difference is from six to nine times the American requirement, with the average at seven. Seven times as many workers crowd into a Japanese weaving mill as in an American mill of the same number of looms. That condition in itself leads to inefficiency.

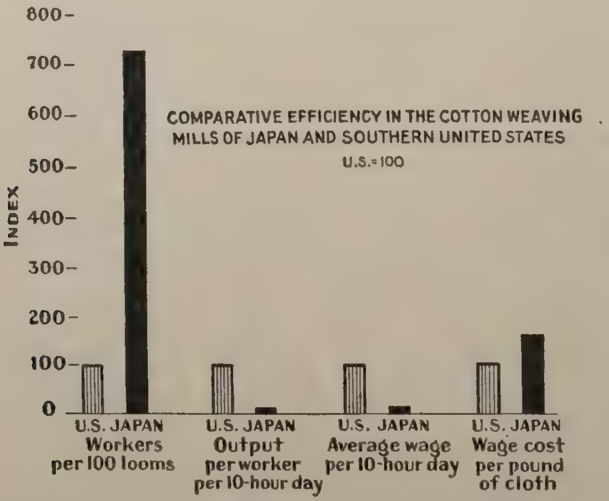

FIG. 117.—The great discrepancy in the efficiency of the workers in the weaving mills of the two countries is due largely to the use of automatic looms in America. The American wage costs per pound of cloth are actually lower than the Japanese.[1]

The output per American worker in pounds of cloth per 10-hour day is from four to ten times the Japanese worker's output. Seven and a half times the Japanese output is the average. Seven and a half times the output and five and a third times the wage leaves the American manufacturer with a wage cost per pound of cloth that is less than the Japanese (see Figure 117). In spite of the incredibly cheap Japanese labor, American manufacturers produce at a wage cost per pound of cloth that averages from 18 to 57 per cent less than the Japanese[1] (see Table XXXIII). It is almost unbelievable until the differences in individual output on similar grades of cloth are examined. The Japanese worker is producing 9 and 16 pounds of cloth to the American 88 and 97, 8 and 18 to 185, 26 to 168, 35 to 148. Even a wage of 60 cents a day cannot make up that difference. The fault is not the worker's. The machinery, the methods of production and the cheap wage system are the chief causes.

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[1] Data from Table XXXIII.

Since the wage costs on American yarns average 35 per cent more per pound of yarn than the Japanese, and the wage costs on American cloth (not including the labor costs in the yarn) average 33 per cent less per pound of cloth, the one nearly balances the other. This explains why American cotton textile manufacturers can sell in the same international markets with the Japanese. The superior efficiency of the American worker offsets to a very considerable extent any advantage the Japanese manufacturer may have in lower wages. And when the extra labor costs that grow out of the cheap labor system are added to the wage, the Japanese manufacturer is found to benefit very little, if any, by his so-called cheap labor.

Efficiency in Other Industries

Other industries, besides the textiles, are similarly overmanned by cheap labor. The railways employ 19 workers per mile of track to 7 in the United States.[2] The raw silk industry employs more than twice as many girls at the reeling basins as they do in Italy.[3] The steel industry is overmanned. The Minister of Commerce, in an interview to the press in June, 1929, announced with much pride the approach to western efficiency standards in the Japanese steel industry and the decline in the number of Japanese workers needed to produce 1 ton of steel from 16.6 in 1920 to 6.1 in 1928.[4] In coal mining, the output per worker per day in the United States is over nine times that of the Japanese and even in England it is nearly twice as much. Some of this difference is due to the greater difficulties of mining and natural differences in the availability of the coal, but much more is due to the greater use of machinery in the American mines. The Japanese worker is paid on the average about $1.22 a day, or only one-fifth the American worker's average wage; nevertheless, he does not produce as cheaply because his output is so much less.[1] It is an important disadvantage for the Japanese coal industry and also for other industries using coal. In every modern industry of Japan, the use of large numbers of workers is evident. In all of them, far greater numbers are employed in relation to the output than are required in similar western industries, and the difference is great enough in most instances to offset the cheaper Japanese wage.

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[1] Mr. Chalmers, *op. cit.*, estimated the weaver's wage per pound of cloth on automatic looms in America to average 28 per cent below the Japanese weaver's wage on the same product.

[2] Based on data published by the Interstate Commerce Commission in the Statistical Abstract of the United States, 1928; and Financial and Economic Annual of Japan, *op. cit.*, 1928; and Japan, Department of Railways, Annual Report, 1926.

[3] Personal investigation.

[4] *Trans-Pacific*, *op. cit.*, June 27, 1929.

POSSIBLE INCREASES IN EFFICIENCY THROUGH SHORTER HOURS

It is very probable that the curtailment of working hours and the abolition of midnight labor for women and children in the spinning industries may result in an actual increase in the efficiency of the workers sufficient to offset any reduction in hours. The Toyo Spinning Company, anticipating the inevitable necessity of conforming with international standards, began an experiment in one of their factories near Tokyo in 1925, which gave most surprising results. They determined to abolish the midnight shift by limiting the operation of the plant to the hours between 5 a.m. and 11 p.m., using much the same system that has been adopted by the most of the mills since July 1, 1929. After one year's trial of the shorter working day, they found that the amount of sickness among the operatives was considerably reduced and that the pale swollen "spinning-room faces" had entirely disappeared. The amount of absenteeism was reduced. The labor turnover decreased. The number of spindles operated per spinner increased and the quality of the product improved. Five additional hours a week of leisure for the operative resulted in improved efficiency and better quality of product.[2]

This Toyo experiment points to a whole new method of approach for Japanese manufacturers. It sows the seeds of doubt regarding the advantages of long working hours. It suggests that long working hours do not necessarily make for lower labor costs. It opens up the possibility that new roads to industrial economy lie through the labor factor in industry, and it places emphasis upon the importance of efficiency.

Fatigue originating from long hours of labor is an important cost factor in industry. Continuous day-and-night industries in this country discovered that truth back in 1922 when some of the plants began switching from the old two shift system of 12 hours' labor to three shifts of 8 hours each, and the Federated American Engineering Societies appointed a committee to discover what the effect of this change would be. The committee discovered, much to everyone's surprise, that in the plants that had made the change, the increased efficiency of the workers offset in whole or in part the extra labor cost of the third shift. In the report of its findings the committee stated:

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[1] Data for these estimates from U. S. Statistical Abstract, 1928; Statistics of the Department of Commerce and Industry, *op. cit.*, 1927; Statistical Abstract of the United Kingdom, 1911–1925. Estimates for Japan and United States based on five-year averages, for the United Kingdom on a two-year average, 1924 and 1925.

[2] Personal account of officers of the factory visited in July, 1926; and official statement published by the Government Bureau of Social Affairs and translated in *Industrial and Labour Information*, *op. cit.*, Vol. 22, No. 6, May 9, 1927, p. 227.

> The effect of the 8-hour as compared with the 12-hour shift operation, on the quantity and quality of production has been satisfactory where good management and cooperation of labor have been secured. In practically every major continuous industry, there are plants which have increased the quantity of production per man as much as 25 per cent. In a few exceptional cases the increase has been much higher. Evidence shows also an improvement in quality of production following the reduction in the length of shifts.
>
> The change from two to three shifts has in practically every case reduced absenteeism and labor turnover, and in a marked degree.
>
> There is a natural divergence of opinion as to the advantages of the three shift operation, but the weight of the evidence and the most positive statements are in its favor.[1]

This is American experience, but the Japanese themselves have had similar experience in the raw silk industry of Nagano Prefecture. The Factory Inspection Service of Nagano Prefecture recently published the results of an investigation into the relation between hours of labor and efficiency in the raw silk industry which showed a remarkable increase in output with the decrease in hours of attendance. From 1892 to 1907, the working day of an operative was 16 hours' attendance and the average output per operative in that time was less by one-third than the output in a day of 12 hours' labor, 13 hours' attendance, in the years 1921 to 1925. Some of this difference is undoubtedly due to improvements in the reeling machinery, but the shift from the old two reel to the four reel basin on which the industry is still functioning was made before 1912, and a half of the gain in output has been made since then. Some improvements have likewise been made in the reeling qualities of cocoons, but what part these changes have played in increasing output, it is difficult to say.

The average daily output per operative in 13 hours' attendance in the years 1921 to 1925 was 11 per cent greater than the output per operative in 14 hours' attendance from 1916 to 1920, and 21 per cent greater than the output per operative with 15 hours' attendance from 1912 to 1915. A large part of these two gains in output must be due to the greater efficiency of the operatives working shorter hours. The average hourly output per operative has been increased roughly 25 per cent with each hour's reduction in the day from 15 to 14 hours and from 14 to 13 hours, which suggests the possibility that further curtailment of the working hours of the raw silk industry would not bring disaster on the industry, especially as that industry has been extremely seasonal in the past and has had to resort to artificial restrictions on production in order to maintain prices (see Table XXXIV).

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[1] Federated American Engineering Societies, Committee on Work Periods in Continuous-Industry, The Twelve-Hour Shift in Industry, New York, 1927.

TABLE XXXIV.—THE RELATION BETWEEN HOURS OF LABOR AND EFFICIENCY IN THE RAW SILK INDUSTRY[1]

Years	Daily hours of attendance	Daily hours of rest	Average output per worker per day, in ounces	Average output per worker per hour of work, in ounces	Index	
					Output per day	Output per hour
1892 to 1907	16	..	9.36	0.581	100	100
1912 to 1915	15	..	11.70	0.780	125	134
1916 to 1920	14	1	12.74	0.976	136	168
1921 to 1925	13	1	14.17	1.162	151	200

[1] Investigation by Nagano Prefecture Factory Inspection Service. Data compiled from account published in *Industrial and Labour Information*, *op. cit.*, Vol. 20, No. 6, p. 255, Nov. 8, 1926.

If, as it would seem, an operative produces actually more in 12 hours of labor than he does in 13 or 14 or 15 hours, it is worth while trying still further reductions. The philosophy that exempted the raw silk and the cotton spinning industries from the regulations on hours under the Factory Act may have been mistaken.[1]

The Nagano investigation had nothing to say about the quality of the silk produced under the changes in the working hours, but it is a well-known fact that the Nagano silk has improved tremendously in quality in the past quarter century. If the worker produces both more and better goods in fewer hours of labor, there must be something to the notion of a definite relationship between the hours of labor and the efficiency of the worker. There is enough at least to make it worth the while of the Japanese industrialists to investigate further.

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[1] The raw silk industry was exempted from the regulation on working hours under the Factory Act of 1923, and was permitted an additional hour of labor each day during the summer, making 12 hours of labor, because of its character as a seasonal industry dependent upon fresh cocoons. The industry has shifted to the use of dry cocoons and since January, 1927, it has been removed from the class of seasonal industries and this privilege rescinded by the Government Bureau of Social Affairs.

INCREASES IN EFFICIENCY THROUGH IMPROVED MACHINERY

A new force is now at work in Japan that will influence the course of labor standards in the future very materially. It is the rationalization of industry which has become so important in the modern industrial system. The most popular subject under discussion at the World Engineering Congress in Tokyo in November, 1929, was the question of rationalization. The precarious position of many of the Japanese industries under present systems of production has determined the need for rationalized methods of industry, and rationalization is beginning to take place slowly. Little by little, old and out-of-date machinery is being replaced by the latest improved models, and with the new machinery, efficiency methods are being introduced. The two great crying needs of Japanese industry—more and better machinery and less but more efficient labor—are being recognized for the first time by the Japanese industrialists.

An immediate stimulus to rationalization of the textile spinning industries has come through the enforced abolition of midnight labor and the consequent reduction of the working day for the machinery from 20 to 17 hours, and for labor from 10 to 8½ hours. As the operatives have resisted any reduction of wages due to this decrease in working time, the employers have shifted their tactics to insistence upon greater individual output. Most of the mills are experimenting with efficiency methods to offset the loss due to the curtailment of working hours, and many have purchased new machinery that not only increases the productive capacity of the mill, but permits of greater efficiency in the labor force.

In the textile weaving mills, the introduction of the automatic loom is working a similar revolution in labor practices. One worker can operate many more of the automatic looms than of the ordinary type. The greater output of the operatives in the weaving mills of the southern United States is due very largely to the use of automatic looms and to the efficiency methods that have been applied to this type of machinery. The Japan Cotton Spinners' Association has stated that the 7,000 automatic looms used by its members constitute 10 per cent of the looms but 33 per cent of their operating efficiency. The use of this type of machinery is increasing in Japan though 100,000 hand looms were still in operation in 1928.[1] The Toyoda Automatic Loom Works—the principal Japanese producer of automatic looms—has reported an increase in orders in 1928 greatly exceeding the productive capacity of the company which has been about 350 looms per month. Some machinery has also been imported from America.

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[1] Statistics of the Department of Commerce and Industry, *op. cit.*, 1928.

Modern machinery has a great deal to do with increasing industrial efficiency. In the tea industry, according to an investigation made by the Kanaya Tea Experimental Station of Shizuoka, the cost of manufacturing 1 kwan (8.3 pounds) of tea entirely by hand is 3.6 times as great as the cost of manufacturing the same amount of tea entirely by machinery, and the labor costs are seven times as great in the hand product as in the machine-made tea. Tea produced half by hand and half by machinery is 2.7 times as costly to make as tea produced entirely by machinery, and the wage costs are nearly four times as great. In the picking of tea, labor costs for hand-picked tea amount to over one-third more than for tea cut with scissors.

Efficient labor is vital to efficient industry, but labor can do little to increase its output without the aid of improved machinery. It is the

TABLE XXXV.—LABOR COSTS IN JAPANESE TEXTILE MILLS[1]

	Estimated Percentage of Payroll
Money Wage	105 to 130
1. Workers' regular earnings	100
2. Semiannual bonus	5 to 30
Maintenance Wage	20 to 50
3. Lodging in company dormitories	
4. Board at less than cost in company dining halls	
5. Staple foods, etc. at below cost to non-boarders	
6. Free medical care in dormitory and factory	
7. Educational facilities for compulsory educational requirements	
8. Other educational facilities	
9. Recreational facilities for dormitory workers	
10. Other welfare	
11. Construction and maintenance of mill village, company houses, company stores, company hospitals, etc	
Indemnities	No data
12. Compensation for injury, sickness, death	
13. Allowance for motherhood	
14. Discharge allowance	
Recruitment	8 to 12
15. Cost of recruitment of raw labor	
16. Cost of labor turnover	
Total Direct Labor Costs	133 to 192
Inefficiency of Cheap Labor	Adds an additional unknown amount.
17. Extra force of spare hands (10 to 30 per cent of total)	
18. Multiple cost of large labor force	
Spinning mills, 2¼ to 4⅓ times the basic need measured by output per operative	
Weaving mills, four to ten times the basic need measured by output per operative	
19. Multiple cost of larger supervisory staff and large clerical force	
20. Loss due to poor quality of product from unskilled hands	

[1] Estimates from personal investigation; reports of the Japan Cotton Spinners' Association, *op. cit.;* The Japanese Cotton Industry and Trade, *op. cit.;* and a publication of the Kanegafuchi Spinning Company, Ltd., 1919, *op. cit.*

combination of the two that Japanese industry most needs. So long as labor is forced to perform many operations by hand that can be more quickly and uniformly performed by machinery, the most skilled of labor will be inefficient. So long as working hours are long, wages low and labor practices based on those hours and those wages, while women work at their tasks with their babies strapped to their backs, and little consideration is given the individual because he is so cheap, the very best and most modern machinery will be inefficiently operated.

It is the general presumption that Japanese manufacturers have a great advantage over western industrialists in their supply of cheap labor with long working hours. That Japan's labor is her major industrial asset is quite true. The resources of labor are abundant, but labor for industrial purposes is scarce and it is unskilled and its cheapness is open to question. Some of the charges that must be added to the direct wage payments to arrive at the full labor costs have been discussed in the last two chapters. They are summarized in Table XXXV. The extra payments that subsidize the cheap wage, the costs of housing and food, the cost of recruitment, the multiple costs of inefficient labor, the effect of poor and uneven quality from unskilled hands, though it may be impossible to estimate them accurately, are as much a part of the real labor costs as the wages themselves. The wide margin of differences in output per worker between American and Japanese labor suggests a fertile field of research for Japanese industrialists.

CHAPTER XXI

THE DEVELOPMENT OF A LABOR MOVEMENT

JAPAN cannot depend indefinitely upon cheap labor to support her industrial development. Cheap labor is at best only a temporary phenomenon. Every industrial nation has passed through a period of low wages. With the progress of industrialism and increased production, wages rise and hours of labor decline. There is no comparison, for instance, between the present day standards of labor in England and America and the cheap labor of the early days of the industrial development in those countries.

THE PRESSURE OF INTERNATIONAL STANDARDS

Japan will not be able to escape the natural consequences of her industrialization. Wages will inevitably rise. Forces are already at work on her cheap labor that will fundamentally alter its character. The pressure is being exerted both from within and from without the country. The external influences have been especially powerful. In the early days of the Industrial Revolution in England and in America, conditions of labor in one country had comparatively little effect upon distant countries. At the present time, however, the progress of mechanical invention and the improvements in communications have so knit together the nations of the world that cheap labor in one country disturbs the balance of international trade and reacts on labor and industry in other and distant countries. International standards have been established for labor, not through altruism so much as through commercial expediency, and countries engaging in world trade are subject to bitter attack and high tariff barriers if they do not meet those standards. The pressure for better labor conditions in Japan has come, not only from Japanese labor, but from both labor and capital in the countries of higher standards. It was the pressure of international opinion that finally brought about the abolition of midnight work for women and children in the textile mills of Japan and consequently shortened the working day in that important industry. It was the pressure of international opinion that raised the legal age limit for child labor in Japan. International opinion has set the stage for the abolition of underground work for women in Japanese mines.

THE BACKGROUND OF THE LABOR MOVEMENT

In all these changes, Japanese labor has not remained quiescent. The growing consciousness of its position and of its power has been a substantial influence in putting into effect the reforms that have originated from abroad. Japan has a labor movement. It is in its infancy and its significance today lies, not so much in its record of accomplishment, as in its potentialities as one of the principal factors in the further industrial progress of Japan.[1]

From other countries have come the liberal and radical social doctrines that have stimulated Japanese labor to act for itself. Ideas of democracy and socialism began to flow into Japan almost as an integral part of the machine economy that the government imported from the West. The labor movements and labor parties of other lands have served as models for the Japanese labor organizations. The International Labour Office has given both encouragement and aid to the movement. The new liberal social doctrines were limited at first to the intellectual classes—university professors, lawyers, journalists, and religious leaders—but from these leaders they have finally penetrated down to the well-guarded masses.

The first manifestation of the new ideas among the workers occurred in 1883 in the strike of the rikisha men against the introduction of horse trams. By the end of the nineteenth century, a liberal social movement of the workers had taken root. The societies which were organized by the intellectuals for the spread of social theories among the workers began to take on more of the character of labor unions. The Workers Faithful Friend Society (Shokko Giyu Kai), organized in April, 1897, became in December of the same year the League for the Formation of Labor Unions (Rodo Kumiai Kisei Kai) which in turn became the excitative force in the new movement. This society worked for the passage of a factory law and lent assistance to the formation of new unions. The most powerful of the new unions formed by the League was the Union of Railway Workers (Nittetsu Kyosei Kai), but it was very soon suppressed by the government for alleged revolutionary tendencies. Most of the unions of this period were essentially for mutual aid, and their activities as unions were more political than economic. As they grew in number and size, however, strikes began to occur with more and more frequency. At this development, the Japanese government took alarm and intervened with the famous Article 17 of the

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[1] The background of the labor movement has been obtained from the literature of the different unions, from interviews with the union leaders, and from that admirable summary, "Progress of the Labor Movement in Japan," published in the *International Labour Review*, Geneva, Vol. 5, No. 3, March, 1922.

Public Peace Police Regulations of 1900,[1] which had the effect of denying to the workers the right to strike. It was a severe blow to the infant movement and it came at about the same time as the industrial depression following the war with China. The combination of adverse forces was too great for the young movement. It had not taken strong enough hold among the working population. The professors were forced back into their universities where they turned their energies again to the teaching of social theories and to the formation of societies among their students for further study of social problems.

There followed a barren period of 12 years which, except for sporadic outbursts which were speedily and severely put down by the government,[2] was productive only of the droning of voices in the universities where social theories were being discussed in a few of the classrooms. Socialism was then the dominant theory among the intellectuals. When the war with Russia was opposed by them, many were sent to prison for their sentiments and under the license of patriotism, socialism was suppressed.

The Yuai Kai

The present labor movement of Japan might be said to have begun in 1912. In that year, the Yuai Kai (Friendly Society) was formed. It was destined to be the parent of the present General Federation of Japanese Labor. This society did not begin as a labor union but as a mutual aid or social welfare society. Its original program, which is given below, had none of the characteristics of a labor program. It declared solely for the promotion of the physical, moral, and economic well-being of the worker through mutual cooperation. There was no mention of class warfare or even of collective bargaining and the rights of labor.

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[1] Article 17 of the Police Regulations of 1900:

No violence shall be inflicted upon others, nor threat of violence made against others, nor the character of others defamed in public with the following enumerated objects in view, and no inducement nor instigation shall be offered to others with the objects in view expressed in clause 2:

1. To make others join or prevent others from joining associations formed for the purpose of cooperation in regard to conditions and rewards of labor.
2. To make employers discharge employees or refuse applications for employment, or to make employees neglect their duties or refuse applications for employment in order to effect a lockout or a strike.
3. To compel by force others to agree in regard to conditions of labor or rewards of labor, or to inflict violence upon others, or make threat of violence against others to compel them by force to agree in regard to conditions of rent of land for agricultural purposes.

[2] Notably the "red flag case" in 1908. At a street meeting in Tokyo to welcome home the socialists released from prison where they had been sent because of their opposition to the Russian War, the sympathizers appeared with red flags. The meeting was broken up by the police and resulted in executions and long imprisonment for some of the leaders.

THE ORIGINAL PROGRAM OF THE YUAI KAI

1. The moral, intellectual, and technical training of members in accordance with common ideals.
2. The improvement of the position of the members by sure and steady methods and by combined efforts.
3. The achievement of the ideals of solidarity by cooperation and mutual aid.[1]

The Yuai Kai was organized by the present president of the General Federation of Japanese Labor who was then a young university graduate interested in social welfare and acting as secretary to a Christian missionary of the Unitarian Church. His missionary employer gave him a free hand to carry on his work, and he collected about him a committee of intellectuals who gave aid and advice to workers especially in labor disputes and in strikes. From that beginning, the Friendly Society grew into a labor federation which has taken and held the key position in the Japanese labor movement ever since. The headquarters of the present General Federation of Japanese Labor are still in the old Unitarian church. The Yuai Kai was very careful in those early years to avoid difficulties under the Police Peace Regulations of 1900, which had wrecked so many labor organizations before it, and functioned along very conservative lines.

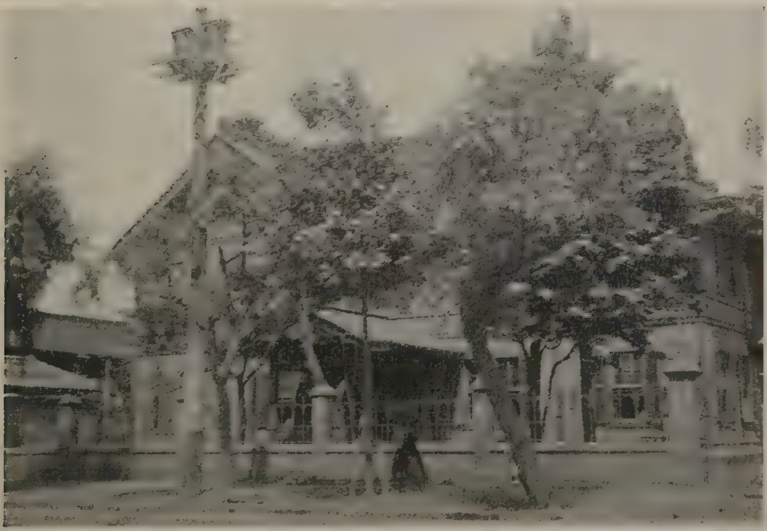

FIG. 118.—The headquarters of the General Federation of Japanese Labor are in an old Unitarian church in Tokyo.

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[1] *International Labour Review, op. cit.*, Vol. 5, No. 3, March, 1922, pp. 437–454.

With the aid of improving business and the standards set by the first factory act which was passed in 1911, labor unions again began to form within and without the Yuai Kai. Societies for the formation of labor unions were again organized in the universities and student members left the universities as leaders of the unions they formed. Many of the most radical labor unions of today began with social study classes in the universities or the Y.M.C.A.'s, or with journalists' welfare groups and similar activities on the part of other so-called intellectuals. In spite of Article 17 of the Police Regulations, the labor movement was reborn.

THE PRESENT LABOR MOVEMENT

The World War gave a tremendous impetus to industry and also provided a stimulus to the labor movement. The germ of unionism had already been planted and with the severe shortage of industrial labor, which occurred very shortly after the beginning of the war, it did not take long for unions to form in every industry. Strikes were called and wages increased. The stress of business was great and employers preferred not to seek the aid of Article 17 of the Police Regulations at the risk of interrupting production. It was cheaper to yield to the workers' demand for increased wages.

The movement had now reached down to the workers. It became part of their mental outlook. They formed new concepts of their social rights and were prepared to fight for them. Unions came into being without the aid of intellectuals though the intellectuals continue to lead most groups even to the present day. Some leaders rose from the ranks. Ideas of democracy and social equality were extended into every class and influenced the thinking of the entire population. Besides factory workers and workers on railways and street cars, unions were formed by fishermen, by tenant farmers, by workers in household crafts, and by workers in commercial houses. Even the outcastes, of whom there are between 1,000,000 and 3,000,000 in Japan still suffering social ostracism, have organized to insist upon their equality with other citizens.[1]

The international recognition of labor organizations and labor problems that was accorded in connection with the negotiations at the Peace Conference following the World War and the first International Labour Conference in Washington in 1919 acted as a strong incentive to labor organization in Japan. Although the Japanese government ignored the Japanese labor unions in the selection of the labor delegate to the Washington Hours Conference, the evasion raised such a storm of protest that the government was subsequently forced to acknowledge the right of the labor unions to representation in the election of delegates to later International Labour Conferences.

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[1] Estimates respectively by the Social Work Bureau of the Ministry of Home Affairs and by the "Suiheisha," the organization of the outcastes whose membership is estimated at 40,000, published in *Trans-Pacific, op. cit.*, Dec. 10, 1927.

While the material benefits of the Washington Hours Convention have been slow to take form in Japan, the subjective effect has been far reaching. The British Labour government and the Russian Soviet government have also exercised a strong influence on the minds of the Japanese workers. The fact that labor organizations in other parts of the world were accepted and respected gave new hope in spite of the dampening influence of the Japanese government's repressive acts.

FIG. 119.—The tenant farmers have organized unions to protect their rights in the land. Leaders of the right wing group at Gifu.

The spread of education and the progress of communication facilities also contributed to the rise of a labor movement. By 1920, Japan had laid the foundation of a real labor movement.

The trade union membership in June, 1929, amounted to 321,125 workers, or 6.7 per cent of the industrial population. It is not a formidable number but the strength of the movement cannot be measured entirely by membership figures. Unionization has taken place primarily among the male workers who constitute 96 per cent of the membership, and in the skilled industries, as is generally the case. The engineering trades have 32 per cent of the union membership, and the transportation groups 40 per cent. The remaining 28 per cent are divided among a long list of industries including textiles, chemicals, gas and electricity, mining, food and drink, and others (see Table XXXVI).

TABLE XXXVI.—TRADE UNION MEMBERSHIP IN JAPAN, JUNE, 1928–1929[1]

Industry	June, 1928				June, 1929		
	Unions	Membership			Unions	Membership	
		Male	Female	Total		Total	Per cent
Machinery and tools	66	96,827	1,563	93,390	64	103,025	32.2
Chemicals	57	8,881	1,086	9,967	61	11,365	3.5
Textiles	20	4,986	6,455	11,441	21	14,923	4.6
Food and drink	12	4,055	376	4,431	17	4,844	1.5
Mining	16	8,073	5	8,078	15	6,212	1.9
Gas and electricity	13	10,781	85	10,866	12	10,179	3.2
Transportation	56	114,738	892	115,630	67	127,956	39.8
Communication	1	1,211	......	1,211	1	1,950	0.6
Building and construction	22	2,551	......	2,551	20	2,275	0.7
Miscellaneous	226	39,020	1,513	40,533	164	38,396	12.0
Total	489	291,123	11,975	303,098	542	321,125	100.0
Percentage	...	96.0	4.0	100			

[1] Data compiled by the Bureau of Social Affairs of the Home Office, as published in Mitsubishi *Monthly Circular*, *op. cit.*, September, 1928, and October, 1929.

OBSTACLES TO THE LABOR MOVEMENT

There have been many serious obstacles to hinder the growth of the Japanese labor movement. The wonder is not that it is so small, but that it has survived at all. The present character of Japanese industry has been a major obstacle to unionism. Of the factory industries, the textile mills are the most important, employing about half of the factory workers. Little more than 1 per cent of this great body of factory labor is organized. The work is unskilled and 81 per cent of the workers are women and girls, mostly young girls whose very youth precludes an interest in labor unionism. Two-thirds of these girls and women and one-third of the men workers in textile mills live under the eyes of the factory managers in dormitories supervised and controlled by the management and within the factory gates.[1] The labor turnover is large, and it is almost impossible to educate this ever changing group to the value of organization. Labor movements in other countries have found the same conditions extremely difficult to overcome. The textile workers are obviously a group to whom labor unionism will come later than to others.

Of the rest of the factory workers—the 49 per cent engaged in other industries—one-third are employed in factories of between 5 and 30 workers, in small and scattered shops where the personal relationship between the employer and the worker prevents the growth of group consciousness, and the small industrial units retard the progress of unionism.[1] These two groups, the textile mills and the small unit factories, consitute 68 per cent of the factory population.

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[1] HARADA, *op. cit.*, as translated from *Shakai Seisaku Jiho*, No. 83.

The Household Industries

In addition to the factory workers, there are hundreds of thousands of industrial workers in feudal household industries employing less than five workers, who are not included in the government estimate of the working population in modern industries. Most of the goods for purely Japanese consumption are made in the household of a master craftsman with the aid of apprentices living under his roof as part of his family. This type of labor belongs to another generation and another economy. It is not ready for unionization. In Osaka City, the major industrial center of Japan, over two-thirds of the industrial establishments, employing one-fourth to one-third of the workers, are without power and employ less than five workers.[2] There are also vast numbers of day laborers who by the nature of their employment are not likely material for unionization. In the December, 1928, official estimate of the working population in modern industries, 38 per cent are classed as day laborers and others, and of this group less than 2 per cent are organized (see Table XXXVII). A very large part of the working population of Japan, because of the present organization of industry, offers serious resistance to the progress of a labor movement. In the transportation and communication industries, which are thor-

TABLE XXXVII.—THE WORKING POPULATION IN THE MODERN INDUSTRIES OF JAPAN, DECEMBER, 1928[1]

Employment	Male	Female	Total	Percentage of total	Percentage unionized (estimated)
Factory labor	1,192,857	1,031,688	2,224,545	46.1	6.5
Miners	233,818	61,783	295,601	6.1	2.6
Transportation and communication workers	424,111	33,445	457,556	9.5	27.7
Day labor and others	1,440,382	406,696	1,847,078	38.3	1.6
Total	3,291,168	1,533,612	4,824,780	100.0	6.4

[1] From data compiled by the Bureau of Social Affairs of the Home Office published in Mitsubishi *Monthly Circular*, *op. cit.*, May, 1929.

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[1] Estimated from Statistical Report of Factories (in Japanese), *op. cit.*, 1924.

[2] An estimate based on the statistics of factories in Statistical Abstract for Osaka, *op. cit.*, 1924, p. 89.

oughly modern, unionization has extended to nearly 28 per cent of the workers.

The Influence of Paternalism

The paternalism prevailing throughout Japanese industry is an obstacle to unionization. The very close relationship between the worker and the employer has characterized Japanese industry for a very long time and has been carried over even into the large and modern factories. The dormitory system, the semiannual bonus, the extra payments of rice and clothing in lieu of wages, the employee savings plans, all bind the worker to his employer more securely than the modern wage system. With such a relationship, it is difficult for the workers to combine for possible action against their employers, and it has been the policy of most of the large companies to exclude unionism definitely from their factories.

Government Suppression of the Labor Movement

In addition to the internal resistance to unionization, the Japanese labor movement has had to combat the active opposition of the government. So persistent have been the efforts of the government to suppress the movement that the antagonism of the employing class and their methods of combating unionism have taken second place in considerations of union policy. The government has been the chief opponent of the movement. From the very beginning, it has opposed the development of labor unions and whenever a union has become at all powerful or radical or in any way troublesome, it has been dissolved by the government forthwith.

The police of Japan are national not local and are employed as a national body to keep constant watch for "dangerous thought," for the government of Japan is very autocratic. The police attend all labor meetings. They watch the movements of labor leaders. Disguised as students, they attend the classes of liberal professors of economic thought. They report to the Home Minister on the activities of anyone and everyone who shows any interest in Japanese labor and Japanese labor unions.

The police interfere in strikes and arrest the strikers. They raid the offices of labor unions and search for radical literature. They frequently prevent meetings where it is thought the speeches will be "dangerous thought," and break up those that do not conform to their thought standards. At May Day celebrations in the large cities, police officers sit on the platforms at the mass meetings, not as honored guests, but in order that they may censor each speaker as he speaks. When the discourse verges on "dangerous thought," the speaker is silenced and his address brought to a sudden close. Some speakers are allowed to proceed to the end of their talks, but others are stopped in the midst of their opening sentences. Many thousands of arrests of workers and leaders are made every year for sundry activities in the cause of unionism. Constant police supervision and government suppression attend the labor movement of Japan.

In the fall of 1926, 37 students of the leading universities and colleges were indicted and arrested for "dangerous thought." It was said that they were involved in a nation-wide plot for the study and propagation of social theories. Chief among the charges against the students was an alleged attempt to transmit a message to a Russian workers' delegate when he passed through Kyoto on his way home from Tokyo. This action was regarded by the police as the first attempt to internationalize the movement. It was never brought out that the students had done anything more than organize clubs for the study of social sciences on a national scale and collect some radical literature on changing the social system, educating the proletariat, and opposing military training in the schools. The arrests were made in December, 1925, and preliminary trials given, but the whole affair was kept from the public by an official ban on the news until the formal indictment in September, 1926. The 37 boy students were dismissed from their universities and were under arrest for nearly 10 months before they came to public trial for their offences.[1]

Following the first general election under the Universal Manhood Suffrage Act in February, 1928, 1,000 workers and intellectuals were arrested as communists. News of these arrests was banned until April. It was then declared that the police had uncovered a nation-wide communist plot. The evidence of the plot was based largely on literature distributed during the election campaign and found in raids upon political labor and union headquarters. The Japanese press openly inferred that it was less of a communist plot than a political manoeuver on the part of the Seiyukai, the governing party, to turn public attention from certain autocratic acts by its leaders at the time of the election. The press refused to take seriously the charge of any national danger from the activities of a handful of powerless communist agitators. Many of the arrested persons were later released for lack of evidence, but hundreds were committed for further trial.[2] In April, 1930, two years after their arrest, 35 of the 1,000 alleged communists were notified to prepare themselves for public trial. Of the 35, 13 had been released on bail, but the remaining 22 had spent their two years of waiting in prison.[3]

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[1] From reports in current newspapers in Japan, September, 1926.

[2] From current reports in the *New York Times* and the *Trans-Pacific, op. cit.*

[3] *Trans-Pacific, op. cit.*, May 1, 1930.

These are two spectacular instances of the government's active opposition to the development of social movements, but in their ordinary day to day activities, the labor unions are in almost continuous conflict with the police. Arrests of union members, student agitators, and labor leaders are almost daily occurrences.

Following the spectacular round-up of April, 1928, the Home Office decided to appropriate 2,300,000 yen ($1,150,000) to provide a special bureau not only to deal with radical activities in Japan itself, but to study the methods of and cooperate with those engaged in the suppression of communism in other countries. For this purpose, special commissioners were dispatched to Peking, Harbin, London, and Berlin. Within the country, extremist organizations were suppressed; social study groups were abolished or forced to curtail their activities; liberal and radical university professors were dismissed from their posts; and scores of girl and boy students were arrested for belonging to social science clubs. The Labor-Farmer Party of the left, the Council of Japanese Labor which was the left wing of the labor movement, and the League of Proletariat Youth were dissolved by government order.

Finally, on June 29, 1928, a special edition of the *Official Gazette* promulgated an emergency Imperial Ordinance in order to provide heavier penalties including capital punishment for radical plotting against the constitution and the political system of Japan. The Imperial Ordinance revised the Peace Preservation Act of 1925, which fixed the maximum penalty at 10 years' imprisonment, and provided in its stead punishment ranging from confinement for not less than 5 years, with or without grace, to capital punishment for those who organize secret associations with the aim of changing the fundamental national constitution, or for leaders of such organizations. The lesser punishments are for those who form or even join secret associations with the aim of destroying the system of individual property ownership. It is specifically provided that the punishment apply also to the attempted cases of the offences specified.

The Imperial Ordinance raised a storm of protest, not alone from labor and farmer unions, but from all liberal bodies and from the Japanese press in general. As it was promulgated when the Diet was not in session, it required the approval of the Diet when it reconvened in order to become a permanent law. It was generally hoped that this approval would not be granted, but that hope was soon dissipated when the revised law received *de facto* recognition at the next session of the Diet. Immediately following the Imperial Ordinance, many arrests were made secretly under the provisions of the new law.

Though the repressive measures of the authorities have undoubtedly retarded the progress of the Japanese labor movement, the government is laboring in vain. The spread of ideas cannot be stopped by legislation or police action or even by death penalties. The recent failure of the government, in spite of every effort to locate a mysterious radio station that was broadcasting "dangerous thought" over Japan in perfect Japanese, is prophetic of its impotence.

Internal Dissension in the Labor Movement

At one time or another, the various social doctrines related to socialism, anarchism, syndicalism, and communism have found their way into Japan. Usually, they have been imported by the intellectuals and by them disseminated to the working classes. The new theories have come into the country in waves. Each group of intellectual theorists has brought back the social doctrines of the group or groups with whom they were associated abroad, or that were dominant at the time of their travels and study. And instead of merging with the general trend of liberal thought in Japan, they have remained loyal to their chosen doctrines and fostered them to the exclusion of all others. As a result, the Japanese labor movement embraces all the varying and conflicting liberal social doctrines of the world without any cohesion and with the extremes and means in open conflict. Internal strife is a fourth obstacle to the development of a labor movement. The Japanese workers are seeking an adjustment with the new economic order, but they have chosen a slow and wasteful process. The labor movement is split three ways; the farmer movement is split three ways; the outcastes' movement is split in two.

The General Federation of Japanese Labor constitutes the extreme right wing of the labor movement. The Council of Japanese Labor Unions which was dissolved by the government in 1928 as communistic, but the following of which is still a factor in the movement, constitutes the extreme left wing. The third major division is the General Federation of Japanese Labor and Farmers which forms the centrist's wing. In addition, there are any number of small factions which have varying degrees of right, left and centrist sympathies. Outside of the three major groups, there are several independent unions and federations of major importance to the movement. They are the Japan Seamen's Union, the Seamen's Association, the Federation of Naval Arsenal Workers, and the General Federation of Government Employees, all of which are inclined to be more or less conservative; and the General Federation of Japanese Transportation Workers which is somewhat less conservative. A list of the most important unions in the Japanese labor movement, representing 85 per cent of the trade union membership, has been compiled in Table XXXVIII. The full list, as of December, 1928, comprises some 41 federations of 168

TABLE XXXVIII.—IMPORTANT UNIONS OF THE JAPANESE LABOR MOVEMENT[1]

General Federation of Japanese Labor (Nippon Rodo Sodomei):
Membership of 36,000 in 1926 reduced by internal dissension to 22,000 in 1928. Includes unions by locality and craft and industry covering metal workers, textile, clothing, transportation, miners, brewers, electrical workers, shipbuilders, cabinet makers, coopers, postal employees, printers, teamsters, builders, paper, oil, chemicals, motor car, and lumber.

Council of Japanese Labor Unions (Nippon Rodo Kumiai Hyogikai):
Membership of 35,000 at time of dissolution in 1928. Duplicates much the same industries and localities as "Sodomei." Membership, 30 per cent printers, 29 per cent metal workers, 9.5 per cent lumber employees, 8.5 per cent electrical and transportation workers, 8 per cent textile workers, 7 per cent chemical workers, 8 per cent miscellaneous industries.

General Federation of Japanese Labor and Farmers:
Membership 56,000 drawn in large part from dissenters of the other two general federations. Includes also the Federation of Japanese Trade Unions (building and constructions unions), the Confederation of Japanese Trade Unions, Kyushu Federation of Trade Unions, Japanese Miners Union, Textile Workers Union, the Federation of Japanese Stewards Unions, the Federation of Porcelain and Pottery Workers, and the anti-radical elements of the Japan Farmers' Unions.

Japan Seamen's Union (Nippon Kaiin Kumiai):
Membership of 50,000. An independent industrial union of seamen.

Seamen's Association (Kaiin Kyokai):
Membership of 10,000.

Japan Cooks' League (Nippon Shisho Domei):
Membership 7,800 ships' cooks.

Federation of Naval Arsenal Workers (Kaigun Rodo Kumiai Renmei):
Membership 45,000.

General Federation of Government Employees (Kangyo Rodo Sodomei):
Membership of 13,500.

General Federation of Japanese Transportation Workers (Nippon Kotsu Rodo Renmei):
Membership of 17,000. Recently torn by internal dissension between the left, right, and central groups within the federation.

National Federation of Printers (Zengoku Insatsuko Rengokai):
Membership of 3,900.

Federation of Machinists (Kikai Rodo Kumiai Rengokai):
Membership of 2,800.

Ashio Copper Mine Workers General Association (Ashio Dozan Koshokufu So Rengokai):
Membership of 4,000.

[1] This list is made up from a chart of all the Japanese labor unions, which was published in Japanese by a society of journalists in 1925. The original list was checked by personal interviews with labor leaders and visits to the offices of nearly all the important unions in the summer and fall of 1926. There were in addition to the organizations listed, a number of small federations of industrial unions, and many independent unions of street car and railway workers, electrical workers, street cleaners, furniture makers, government employees, longshoremen, and printers, and unions by localities. The above list represents 85 per cent of the total trade union membership. The figures for membership are those given in the original list as corrected for 1926 by officers of the unions visited.

unions, and 292 independent unions for the total membership of 308,900.[1] In the present embryonic state of the movement, it is useless to attempt to enumerate them all. A list completed now would be out of date in six months, so rapidly do changes occur. What constitutes a single federation today may be split by dissension into two or three parts next month. Strong unions are dissolved by the government; others disappear from internal causes; new ones are constantly springing up; and others merged. There is a decided tendency for unions of the same doctrines and the same industry and locality to combine into federations.

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[1] Announced by Japan, Bureau of Social Affairs, and published in Mitsubishi *Monthly Circular*, *op. cit.*, May, 1929.

There has been very little craft unionism in Japan. Though there is duplication and conflict between unions of differing social beliefs, the movement has been spared the paralyzing influence of craft unionism and the jurisdictional disputes that have nearly wrecked the American labor movement. In June, 1928, less than 9 per cent of the union membership were organized in craft unions.

At long range, the conflict between the wings appears to be a tempest in a teapot. The stumbling block to unity seems to be the personalities of the leaders who have been unwilling to relinquish their cherished theories for the sake of a practical labor movement. The conflicting factions differ primarily in the methods they would adopt for securing similar ends and in the degree of importance placed on the same problems.

The General Federation of Japanese Labor puts the emphasis on compromise with the existing order. It uses extremely moderate tactics and is openly antagonistic to communism. It proposes to achieve its ends through collective bargaining and conciliation, labor legislation, workers' education, political agitation, consumption guilds, and co-operatives. It has survived three major ruptures within the organization, which have resulted in the breaking away of the more radical elements and the formation of rival unions.

The Council of Japanese Labor Unions grew out of the first rupture in the General Federation in 1924 and 1925. It disdained to compromise with the existing order and paid the penalty of dissolution by the government, as communistic, in April, 1928. The emphasis of this left wing organization was placed on the collecting of strike funds rather than on conciliation or cooperation. It was concerned more with radical propaganda than with education. It did not approve of union-operated employment agencies or insurance funds. It looked to the state to provide the worker with protection against unemployment, sickness, and death. Its aim was for united political action by the proletariat and for amalgamation of all labor unions into one great class conscious group. It was the organization of the extreme left wing. A new left wing group, which may be expected to replace the dissolved Council, is forming out of the radical elements that caused the third rupture in the General Federation in the latter part of 1929.

The centrists' group, the General Federation of Japanese Labor and Farmers, is made up of dissenters from both the left and the right wings. It was formed as the economic organization behind the Japanese Labor and Farmers' Party, the political party of the centrists. It includes among other groups the elements that caused the second rupture in the General Federation of Japanese Labor which occurred in 1926. It is less conservative than the General Federation and less radical than the Council, but its program is almost identical to their programs. It was organized as a protest against the bickering between the right and left wings.

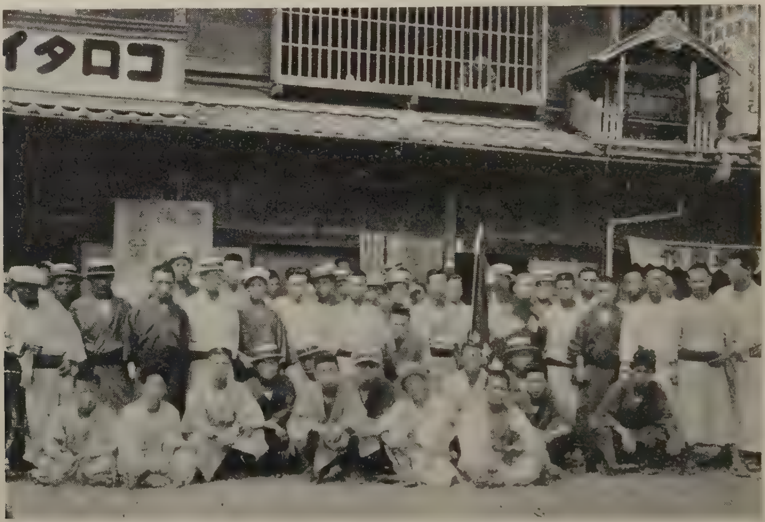

FIG. 120.—A group at the office of the potters' union in Nagoya. The workers were on strike for higher pay and guaranteed dismissal allowances.

The Japan Seamen's Union belongs neither to the extreme right nor to the extreme left. Though it has been troubled with some internal strife, it has kept remarkably clear of doctrinal disputes. It has participated actively in the International Labour Conferences and has worked for the ratification of the draft conventions concerning seamen that have been approved at those conferences. It owns and operates a number of boarding houses for seamen where they may obtain free lodging and food at cost when in port. Through the efforts of this union, a Joint Maritime Board of shipowners and seamen has been established to operate a system of free national employment exchanges for seamen and to arbitrate in disputes between shipowners and seamen.[1] The union has also established a minimum wage scale for seamen effective on most of the nation's tonnage. It has on its program the development of seamen's insurance, the establishment of standards in the manning of crews, the acceleration of the ratification of draft conventions, the establishment of voting residence for seamen, the amendment of maritime laws, better food on ships and liberal labor legislation.

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[1] *Industrial and Labour Information, op. cit.*, Vol. 27, No. 7, Aug. 13, 1928.

Of the other independent unions, the Federation of Naval Arsenal Workers is important for its size but is handicapped as a labor union by having the government for employer. Its policy can never be very radical and in dealing with the government the strike is not an effective weapon. The same difficulty confronts the General Federation of Government Employees which also has a large membership.

The General Federation of Transportation Workers has been torn by internal strife between the left, right, and central wings, but local unions of transportation workers have carried on with distinction. They have made very clever and effectual use of sabotage rather than strikes. When the Tokyo tramway workers were rebuffed in their demands in 1924, the union decided to "work-to-rule" instead of calling a strike. Members were instructed to observe to the letter all the company rules that had fallen into disuse because of increased traffic. Tokyo trams are crowded and run at high speed to cope with the traffic. In working-to-rule, the speed was reduced, the number of passengers was limited, and women, old people and children were given special care even to the neglect of collecting fares from the other passengers. The result was a serious hindrance to service and a considerable loss to the company. Again, in 1929, the Tokyo municipal bus workers conducted a "go-slow" sabotage because of the rejection of their demands by the company. Under the pretext of "Safety Week," the workers slowed down their buses from the 10 mile speed to 7 or 8 miles per hour, stopped their cars longer and examined tickets more closely. The result was to decrease the income of the company by one-half during the month of the strike. Similar use of sabotage has been made by transportation workers in other localities.

For all the bickering and dissension in the labor movement, there is a oneness of purpose that has the effect of unity. Each group proceeds along its own special way toward the same goal. Their demands are very similar. Their programs are nearly identical. Communists, socialists, radicals and conservatives alike, are striving for increased wages, shorter hours, recognition of the right of collective bargaining, minimum wage standards, protection against unemployment, indemnity against discharge, better working conditions, better labor legislation, higher labor standards. That they quarrel among themselves does not entirely destroy the collective effect on public opinion of the bigger movement. The multiplication of theories and internal dissension that has split the movement into so many parts is, in fact, a manifestation of youth. With more maturity a more unified movement may be expected.

In spite of internal strife, government suppression, and intervals of severe business depression, the Japanese labor movement has been growing steadily since its rebirth in 1912. It got its big impetus to growth during the business boom consequent to the World War, but even since 1922 and in spite of the business depressions of 1923, 1927, 1928, 1929 and 1930, the labor movement of Japan had more than doubled its membership by the middle of 1930. This tendency to increase membership in the face of business depressions is strong evidence of the permanency of the movement. The year 1928 was a year of severe government opposition to all radical organizations, many of which were disbanded by official action. In spite of that fact, the membership of the labor movement on December 31, 1928, was within 600 of the 1927 total and by June, 1930, it had increased an additional 13 per cent (see Table XXXIX).

TABLE XXXIX.—GROWTH OF LABOR UNION MEMBERSHIP IN JAPAN[1]

Year	Number of unions	Membership	Index of growth
1922	387	137,491	100
1923	432	125,551	91
1924	469	228,278	166
1925	457	254,262	185
1926	488	284,739	207
1927	505	309,493	225
1928	501	308,900	224
1929	630	330,000	240
1930	700	350,000	255

[1] From announcements of Japan, Bureau of Social Affairs, published in the *International Labour Review*, *op. cit.*, Vol. 14, No. 2, August, 1926, p. 257; *Industrial and Labour Information*, *op. cit.*, July 8, 1929, p. 58; Mitsubishi *Monthly Circular*, *op. cit.*, October, 1929; *Trans Pacific*, May 29, and June 26, 1930. The figures are for the end of the year, except 1930, which is for June.

THE POLITICAL LABOR MOVEMENT

With the advent of universal manhood suffrage under the Act of 1926, Japanese labor turned its attention to political activity for securing its ends. Under this act, suffrage was extended to many who had previously been barred by tax qualifications from participating in elections, and the electorate was increased by some 7,000,000 voters.[1]

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[1] Japan Year Book, *op. cit.*, 1927, p. 76.

Most of the male population of twenty-five years and over can now make use of the vote and the way has been opened for proletarian groups to participate directly in influencing political action.

Japan's political as well as her economic organization is undergoing change. In December, 1925, the first farmer-labor party was organized. Two hours after the inaugural ceremony, the party was ordered dissolved by the Minister of the Interior on the grounds that its motives were revolutionary. A second attempt was made in 1926, and the Rodo Nomin To (Labor-Farmer Party) was formed with the aim of creating one proletarian party for both industrial worker and farmer. This was the party of the left wing of the farmer tenant movement but it was supported by a large part of the labor movement as well. A little later in 1926 the right wing of the farmer movement sponsored the organization of the Nomin To or Farmer's Party, a proletarian party for farmers only. The basic difference between the two was that the original group regarded the interests of labor and farmer as identical while the second group believed that the problems of the two were so dissimilar that they could not be served by one party.

In October, 1926, the Rodo Nomin To,[1] the original party, was split on communism. All of the less radical elements deserted the party. The remaining groups maintained the party as the left wing of the political movement, but repudiated communism. Out of the split grew the Shakai Minshu To or Social Democratic Party, the party of the General Federation of Japanese Labor and the extreme right wing of the movement. Later in the year, dissenters from the Social Democratic group and from the Rodo Nomin To formed the Nihon Rono To or the Japanese Labor-Farmer Party of the centrists, backed by the General Federation of Japanese Labor and Farmers.

These were the four major proletarian parties that participated in the first general election in 1928 under the new suffrage law of 1926. They were considerably at odds with one another in their first test at the polls in the prefectural elections of 1927, running opposing candidates and taking each other's votes. But in the national general election of 1928, they made a better showing of cooperation and agreed, for the purposes of the election, to bury their differences and not to run opposing candidates. For the most part, they lived up to the agreement. In spite of strong opposition from the government and considerable police interference, they returned eight members to the national parliament. Eight members are not very impressive in a total of 466, but it must not be forgotten that the British Labour Party began with two members in Parliament in 1874. In 1924, it was the ruling though not the majority party with 192 seats and again in 1929 it came into power with a total of 289 of the 615 seats. In the general election of 1930 in Japan, the proletarian parties again were at odds with one another and ran opposing candidates in their most promising districts. As a result, they lost three seats in the national Diet, returning only five members though the total proletarian vote had increased nearly 7 per cent over the previous poll of 1928.[1]

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[1] The Japanese names of the various proletarian political parties have been retained in this discussion in order to distinguish them from one another more readily, for the English translations of many of the names are so similar as to be most confusing.

Following the general election in 1928, the Rodo Nomin To, the left wing, was dissolved by the government as communistic, and some of the leaders were arrested. The less radical elements of the party, who were averse to communism and who escaped arrest, almost immediately reorganized in a new and more temperate party called the Musan Taishu To (Proletarian Mass Party). In December, 1928, this party was absorbed in a big merger which included also the Nihon Rono To, the Nihon Nomin To, and four local proletarian parties and which became known as the Nihon Taishu To (Japan Mass Party), a centrist party. In the meantime, there was a left wing element which had not been absorbed in the moderate party and which was without party representation. Many efforts were made to reorganize the old Rodo Nomin To for the left group, but they met with a good deal of opposition from the government. Finally, in November, 1929, a new party of the extreme left was inaugurated without government interference. It is known as the Shin Rono To or Labor-Farmer Party, and it is probable that it will draw some of its members from the centrist party and from those who were formerly affiliated with the Rodo Nomin To before its dissolution. Though each new party seems to be made up of deserters from existing parties, there is some real growth in the movement also. The political labor movement in Japan is still very young, and many more changes will occur before it becomes a significant factor in the government of the country. In the meantime, it has divided into three major groups—the Social Democratic Party (right), the Japan Mass Party (center), and the Labor-Farmer Party (left). It has recently been reported in the press that the outcastes will form a fourth group known as the Japan Liberal Party which they claim will have over 400,000 members.[2]

The labor movement now hopes to accomplish through political action all and more than it has sought through economic organization. It has thrown the full force of its energies into the political movement and has placed its leaders at the head of the political parties. The party platforms and programs are almost identical to those of the unions, except that the emphasis is placed upon achieving their aims through political action rather than through collective bargaining. The aims of the political movement include: legislation for minimum wage standards, shorter hours, recognition of the right to strike and the right to organize in unions for collective bargaining, protection against unemployment, taxation reforms, tenant farmer reforms, and general social and labor reforms (see Table XL). The proletarian parties have displaced the labor unions in the popular interest of the workers. Political action has caught their imagination and party affiliations exceed the labor union membership. The proletarian vote in the general election of February, 1930, totaled 502,313 in contrast with the labor union membership in December, 1929 of 330,000. It has a broader application. City worker and tenant farmer, fisherman and outcaste, feudal worker and factory employee can make common cause in political action.

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[1] *Trans-Pacific*, *op. cit.*, Mar. 6, 1930.

[2] The history of the development of the political labor movement has been obtained from current press reports, interviews with the leaders of the parties and party literature.

TABLE XL.—SOME SPECIFIC PLANKS IN THE PLATFORMS OF THE PROLETARIAN PARTIES IN JAPAN[1]

1. Extension of suffrage to all men and women over twenty years of age
2. Recognition of the right of association
3. Recognition of the right of collective bargaining
4. Recognition of the right to strike
5. Prohibition of night work for women and young persons
6. Prohibition of underground work for women and young persons
7. Improvement or abolition of the system of taxation as regards persons of small means
8. Abolition of consumption taxes on daily necessaries
9. Abolition of customs tariffs
10. Imposition of higher taxes on property
11. State subsidies for families of unemployed
12. A trade union act
13. Establishment of minimum wage standards
14. Amendment of the Health Insurance Act
15. Revision or repeal of reactionary laws and regulations relating to maintenance of the peace and police intervention
16. Amendment of the Election Act
17. Establishment of the 8-hour day in factories
18. Establishment of the 6-hour day in mines
19. Amendment of the Factory Act
20. Amendment of the Mining Act
21. Amendment of the Seamen's Act
22. Fixing of prices of essentials by government
23. Abolition of licensed prostitution
24. Military retrenchment

[1] From the literature of the parties and current press reports as late as Jan. 1, 1930.

It may be that political action is a better vehicle for the Japanese worker than unionism. The Japanese people have for centuries regarded the government as the source of their fortunes. Government paternalism has regulated the smallest details of their lives. It has trained them to expect action from the government on every problem. In spite of its record for suppression, the government has sponsored a good deal of social legislation of one sort or another during the past 20 years. This legislation has been accomplished while labor was without direct representation in the national parliament. It is quite conceivable that the standard of that legislation can be raised through direct political action. The improvements in the status of the Japanese worker that have been achieved will be reviewed in the next chapter.

CHAPTER XXII

THE CHANGING STATUS OF LABOR

THE Japanese labor movement is not at present a very important factor in the industrial economy of Japan. It is small in membership, it is torn by internal dissension, and it is closely restricted by government opposition. The germ of organization that has taken root in Japan is a promise of further organization, and the influence of a mass movement like the labor movement is often out of all proportion to its actual size. Gains made by organized labor are constantly passed on to unorganized labor in order to prevent the further development of unionism, or because the social conscience has been awakened. The conditions of factory labor in Japan have been constantly improving since the passage of the first Factory Act in 1911. These changes give evidence of the changing status of labor in Japan. They cannot be attributed entirely to the influence of the labor movement, for economic conditions, especially war conditions, changing social standards, international conventions, and the Japanese press have done much to raise the status of labor from the low standards prevailing under the feudal economy to their present level. The labor movement has functioned more especially in stating the problems to be attacked and in formulating higher standards for labor, in pointing the way to important reforms and in stimulating the agitation for these reforms.

THE FACTORY ACTS OF 1911 AND 1923

As far back as 1897, the League for the Formation of Labor Unions started the agitation for a factory law and that agitation continued for 14 years until the passage of the first Factory Act in 1911. This act was not enforced until 1916 and was far from ideal as a piece of factory legislation. Very soon after its enactment agitation for its amendment began. It resulted in the Factory Act Amendment Act of 1923 which is the present factory law.

The Act of 1911 applied only to factories of 15 persons or more and to certain dangerous industries regardless of the number of workers employed, exempting other factories not using mechanically driven machinery. It fixed the age for factory workers at a minimum of 12 years, unless the workers were already employed and were 10 years of age or more. It limited the hours of attendance in factories to 12 hours a day for women and young persons under fifteen years of age, but permitted in certain specified industries 2 additional hours of labor a day. It provided a minimum of two rest days a month for women and young persons under fifteen, and four rest days if the factory operated in two shifts of labor alternating day and night. It required employers to give aid and relief in cases of injury, sickness, or death of the factory worker, but not in cases of serious fault by the worker. As the first factory law, it established minimum standards but did not greatly alter the practice of the time, for there were exceptions to nearly every regulation, which had the effect of nullifying the application of the act.

The forces which had brought about the enactment of the Act of 1911 carried forward the agitation for its amendment and brought about the Factory Act Amendment Act of 1923 which was not to be enforced until 1926. The differences in the two acts give evidence of the gradual changes in national standards that are taking place with the industrialization of the nation and suggest the probable future trend in working conditions. The scope of the amended act was extended to factories of 10 or more workers and to some of the industries previously exempted so that the number of workers affected was increased by more than 11 per cent.[1] By a further extension of the act in March, 1929, to cover all establishments using power driven machinery, the number covered by the factory law has been increased by an additional 14 per cent.[2] A great many small household establishments, hitherto unregulated, were thus brought under the provisions of the factory law.

Parts of the act were modified to conform, partially though not wholly, with the international conventions adopted at the Washington Hours Conference in 1919. The age of special protection was raised from fifteen to sixteen years after 1929. The hours of labor for women and young persons under sixteen were reduced from 12 to 11 a day, including 1 hour of rest, though exceptions were made for the silk yarn, silk fabric and cotton spinning industries allowing 12 hours' attendance, 11 hours' labor, until August, 1931. Special arrangement was also made for seasonal industries, allowing 1 additional hour of labor per day in the busy seasons provided overtime is not worked on more than 120 days in the year. And, for a period of 15 years after 1926, the Minister in charge can extend the daily hours of labor by not more than 2 hours in any industry, according to the nature of the work. The date for the prohibition of midnight work for women and children was moved forward from August, 1931, to July 1, 1929, and the midnight hours were defined as from 10 or 11 p.m. to 5 a.m., not 4 a.m., as in the earlier act. Two rest days a month were provided for women and young persons, as in the Act of 1911, with the same arrangement for 4 rest days a month for alternating day and night shifts on an 11-hour day basis. Rules and regulations were established for the prevention of accidents and the spread of disease. Provision was made, under authority of the factory act, for 14 days' compensation or 14 days' notice to the workers upon dismissal. Compensation for injury, sickness or death was extended and the rates and period of compensation increased, and financial assistance for women workers during childbirth was provided.

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[1] *Industrial and Labour Information, op. cit.*, Vol. 23, No. 6, p. 171, Aug. 8, 1927, as announced by the Japan, Bureau of Social Affairs.

[2] *Industrial and Labour Information, op. cit.*, Vol. 31, No. 1, p. 30, July 1, 1929, according to figures published in the official *Rodo Jiho*, April, 1929.

The Minimum Age for Industrial Employment Act which came into force at the same time as the Factory Act Amendment Act of 1923 covers not only factory workers, but workers in mines, construction work, transportation, docks, and warehouses. This act fixes the age limit for all industrial workers at fourteen instead of twelve, and permits the employment of children between the ages of twelve and fourteen only if the elementary school requirements have been completed, or if the worker was already employed at the time the act came into force.

The Amendment Act of 1923 is far from the international ideal standard, but it has raised the status of working conditions in Japan considerably above the earlier level. Although many of the provisions apply only to women and young persons under sixteen, that specially protected group constitutes over half the factory population, and in many cases the regulations for them, especially regarding working hours and conditions of labor, must be applied to all the workers in the factory. The abolition of midnight labor for women and young persons, for example, has resulted in the inauguration of the 8½-hour shift for all labor in spinning mills. As with the Act of 1911, the special exceptions permitted in the Act of 1923 do much to nullify the important changes made, for many of the exceptions have been allowed in those industries where the hours of labor are longest and the bulk of the workers are women and children.

OTHER SOCIAL LEGISLATION

It is not in the factory legislation alone that the changing status of labor in Japan is evident. There has been a good deal of other social legislation which has touched upon most of the problems which the General Federation of Japanese Labor pointed out in its program of 1919. It was in 1919 that the General Federation was reborn of the Yuai Kai (Friendly Society), and that year marks the beginning of the

TABLE XLI.—THE 1919 PROGRAM OF THE GENERAL FEDERATION OF JAPANESE LABOR AND SUBSEQUENT SOCIAL REFORMS BY THE JAPANESE GOVERNMENT

The labor program[1]	Social reforms by government[2]
1. Freedom of association of all workers	1. Recommendations for a trade union law submitted by the government Social Policy Research Committee in 1929–30. Action promised by Premier
2. Abolition of child labor	2. Minimum Age for Industrial Employment Act of 1923, promulgated July 1, 1926 3. Seamen's Minimum Age and Health Certificate Act of 1923
3. Abolition of night work	4. Factory Act Amendment Act of 1923, abolished midnight work for women and young persons between the hours of 10 p.m. and 5 a.m. with 1 hour possible extension, after June 30, 1929 5. Mining Regulation of July 1, 1928, abolished late night work for women and young persons between 11 p.m. and 5 a.m.
4. Establishment of a system of social insurance 5. Establishment of a system of workmen's compensation	6. Health Insurance Act of 1922, came into force July 1, 1926, began benefits January, 1927 7. Post Office Pension Act of 1926 8. Provisions in the Factory Act Amendment Act of 1923 for relief in case of illness, injury, disablement, or death 9. Formal ratification of the international convention concerning workmen's compensation for occupational diseases registered with the League of Nations, Oct. 8, 1928
6. Labor not to be regarded as an article of commerce	10. Factory Act Amendment Act of 1923 11. Home Department Ordinance on Recruitment of Workers, 1924 12. Home Department Regulations for Dormitories Attached to Factories, 1927 13. Prohibition of White Phosphorous Matches Act, 1921 14. Miners' Protection Regulations of August, 1929, prohibiting underground work for women and young persons after 1933 15. Home Department Regulations on Safety and Hygiene, June, 1929
7. Enactment of conciliation and arbitration legislation	16. Act for Conciliation in Industrial Disputes, enforced July, 1926 17. Establishment of the Joint Maritime Board in 1928
8. Provision against unemployment	18. Employment Exchange Act of 1921 19. Seamen's Employment Exchange Act of 1922 20. Ratification of the Washington convention concerning unemployment, 1922

TABLE XLI.—THE 1919 PROGRAM OF THE GENERAL FEDERATION OF JAPANESE LABOR AND SUBSEQUENT SOCIAL REFORMS BY THE JAPANESE GOVERNMENT.—(*Continued*)

The labor program	Social reforms by government
	21. Imperial Ordinance for an Unemployment Census, 1925 22. Establishment of the Joint Maritime Association in 1926 23. Establishment of Seamen's Free Employment Exchanges in 1927 24. Regulations concerning the control of private employment agencies enforced Jan. 1, 1927 25. Registration of unemployed city workers at government agencies in large cities, October, 1929 26. Municipal unemployment insurance schemes for casual labor in Osaka and Kobe
9. Establishment of manhood suffrage	27. Universal Manhood Suffrage Act, enforced in 1926
10. Amendment of the Public Safety and Police Order Law	28. Amendment of the Public Safety Police Regulations in 1926
11. Establishment of a weekly day of rest	29. Provision in the Factory Act of 1923 for 2 rest days a month 30. Regulation of working hours for employees on government railways, by Ministry for Railways in 1929
12. Introduction of the 8-hour day and 48-hour week	31. Provision in Factory Act Amendment Act of 1923 limiting the working hours of women and young persons 32. Mining Regulations of 1928 fix maximum for underground workers at 10 hours a day including 1 hour rest 33. Eight-hour day for postal employees was established in 1929 34. Regulations by Ministry of Railways, 1929, on shorter hours on government railways
13. Equal treatment for native and foreign workers	35. Formal ratification of international convention concerning equality of treatment for native and foreign workers as regards worker's compensation for accidents, registered with the League of Nations, Oct. 8, 1928
14. Establishment of a minimum wage 15. Equal pay for work of equal value 16. Appointment of women factory inspectors 17. Dwellings for workers supplied through public funds 18. Abolition of peonage and indentured labor 19. Improvement of working conditions in home industries 20. Democratisation of the educational system	

[1] *International Labour Review, op. cit.*, Vol. 5, No. 3, pp. 437–454, March, 1922.

[2] Announcements in the Japanese press.

real labor movement in Japan. It is for that reason that the Federation's program of 1919 has been used in Table XLI to mark the progress of social legislation in the following decade. It is not intended to imply by this comparison that the labor movement has been the direct force responsible for all the social legislation that has been enacted, but it is intended to show that the labor movement has pointed the way to that legislation. More important, however, are the changes that have occurred in the short space of 10 years. Japanese industry cannot resist the march of events. A great deal of the legislation has been faulty and wide of the mark, most of the problems have been scarcely touched, but the government's action on so many of the problems set forth in labor's program marks a change in public opinion that is similar to the changes that have occurred with respect to labor in other and older industrial countries, and also points definitely to the temporary character of cheap labor in Japan.

The first article in labor's program of 1919 was the recognition in law of labor's right to organize into unions. The government has not been willing to grant this legal recognition, but *de facto* recognition has been given to Japanese labor unions in many ways. In particular, the government has had to recognize the existence of labor unions in the election of delegates to the International Labour Conference, in the publication of government statistics, and in conciliation and arbitration proceedings. A trade union bill was drafted by the government in 1925 but was not enacted into law. It is a question that comes up again and again at every session of the national Diet, and in 1929, the government Social Policy Research Committee submitted recommendations for a trade union law which Premier Hamaguchi promised to carry out in the course of the next Diet.[1]

The second principle set forth by labor was the abolition of child labor in Japan, and that objective has been partially achieved through the Act Establishing a Minimum Age for Industrial Employment of 1923, and the Seamen's Minimum Age and Health Certificate Act of the same year.

The abolition of midnight work for women and young persons in factories, as effected through the Factory Act Amendment Act of 1923, does not abolish all night work for women and young persons in Japan, but it does limit their labors to the hours before 10 or 11 p.m. and after 5 a.m. A similar ruling was also made for women and young persons employed in mines by the Mining Regulation of the Ministry of Home Affairs in 1928.

Various kinds of social insurance and workmen's compensation have been provided for in the Factory Act Amendment Act of 1923, by the Health Insurance Act of 1922 which began payments in 1927, and by the Post Office Pension Act of 1926.

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[1] *Trans-Pacific, op. cit.*, Dec. 19, 1929.

Government regulation designed to protect labor against excessive exploitation has been enacted, especially in the provisions of the Factory Act of 1923, the Prohibition of White Phosphorous Matches Act of 1921, the Home Ministry Ordinance on Recruitment of Workers of 1924, the Home Ministry Regulations Concerning Factory Dormitories of 1927, and the Miner's Protection Regulations of August, 1929, which prohibit underground work after 1933 for women and young persons under sixteen years of age.

The beginning of conciliation and arbitration legislation has been made in the Act for Conciliation in Industrial Disputes which came into force in July, 1926, and in the Joint Maritime Board with machinery for conciliation of disputes between shipowners and seamen, which was established in 1928.

Some provisions against unemployment have been made by the government through the Employment Exchange Act of 1921 and the Seamen's Employment Exchange Act of 1922. The ratification in 1922 of the Washington Convention on Unemployment and the Imperial Ordinance for an Unemployment Census issued in 1925 were also indications that the government recognized the seriousness of the problem. Practical agencies for the relief of unemployment have been provided through the Joint Maritime Association established in 1926 and the seamen's free employment exchanges established in 1927, as well as through the official employment agencies set up in the larger cities under the Act of 1921. Regulations have also been made by the Bureau of Social Affairs concerning the control of private employment agencies (January, 1927) and the registration of all unemployed city workers at the government employment agencies in the large cities (October, 1929). There are also municipal systems of unemployment insurance for casual labor in Osaka and Kobe. These measures have not been sufficient to cope with the growing unemployment problem which has been induced by a prolonged business depression, and the Cabinet Council and other government agencies are considering further measures for the relief of the unemployed.

Universal manhood suffrage, as it has been called, was established by law in 1926, and at the first general election in 1928 about 7,000,000 voters were added to the electorate, all but 19 per cent of whom made use of their votes.[1] The agitation now is for the extension of suffrage to women and the lowering of the age limit for all voters.

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[1] R. Fujisawa, "Statistical Investigations of the Results of the First Manhood General Election of 1928," *Proceedings of the Imperial Academy*, Vol. 4, No. 8, p. 445, October, 1928.

The Public Safety Police Regulations, against which there has been such a storm of protest from all labor sources, were amended in 1926 and the offensive "Article 17" was repealed. While this achievement may be regarded as a victory for labor, the government has since passed other regulations on the activities of labor that are more severe and more repressive even than Article 17 and that provide the death penalty for plotting against the government.

Some approach has been made toward the introduction of the 8-hour day and the 48-hour week, with a weekly day of rest, though the legislation and government regulations enacted do not meet the standards set by international convention. The Factory Act Amendment Act of 1923 established the maximum hours of labor for women and children in factories at 10 or 11 per day. The Mining Regulations promulgated by the Bureau of Social Affairs in 1928 fixed the maximum working day for all underground workers at 10 hours including 1 hour of rest. The postal authorities established the 8-hour day for postal employees in 1929, and in the same year the Ministry of Railways reduced the working hours of employees on government railways and fixed the maximum at 18 hours every other day.

The problem of the treatment of native and foreign worker is not as serious in Japan as in America where the working population is composed of many nationalities of immigrant peoples, but there is the problem of the Korean workers who migrate to Japan and who are more easily exploited than are the Japanese. The government has taken the first step toward regulation of this problem by ratifying the international convention concerning equality of treatment for native and foreign workers as regards workmen's compensation for accidents. The formal ratification was registered with the League of Nations, October 8, 1928.

PRESENT AIMS OF LABOR

The government has taken no definite action on any of the remaining seven articles of labor's 1919 program, but the question of minimum wages has been vigorously attacked by the Seamen's Union, and minimum standards have been established on most of the nation's tonnage. While some progress has been made in the improvement of the working conditions in home industries by the extension of the Factory Act Amendment Act in March, 1929, to cover all establishments using power driven machinery irrespective of the number of workers employed, there are still domestic establishments which are not covered by the Act. A few apartment houses have been set up in Tokyo by the municipal government for salaried workers, but, in general, the housing of industrial labor has been left to the workers' own initiative or to the employers and the factory dormitory. The rest of labor's program, which included the appointment of women factory inspectors, abolition of peonage and indentured labor, democratisation of education, and equal pay for work of equal value, has not yet born fruit.

TABLE XLII.—PRESENT PROGRAM OF THE JAPANESE LABOR MOVEMENT[1]

1. Increase of wages and opposition to reductions
2. Reduction of working hours and introduction of the 8-hour day
3. Organization of workers into unions
4. Creation of strike funds
5. Abolition of differences in wages for work of the same nature
6. Recognition of the right to bargain collectively
7. Recognition of unions
8. Amendment of the Health Insurance Act
9. Guarantee of a fixed sum as discharge allowance
10. Protection against unemployment
11. Establishment of a minimum wage
12. Improved labor legislation and legislation for the protection of workers
13. Reform or abolition of the dormitory system in factories
14. Freedom of workers in factory dormitories
15. Better food in factory dining halls
16. Amendment of the factory act, providing for inspection of living conditions in factory dormitories
17. Release of workers' savings from the control of employers
18. Abolition of abuses in recruiting
19. Better working conditions
20. Ratification of the draft conventions adopted at the International Labour Conferences
21. A trade union law
22. Amendment of election laws
23. Repeal of the Public Peace and Safety Maintenance Act
24. Abolition of the system of temporary employment
25. Reengagement of workers after completion of military service

[1] Compiled from the literature and programs of the important unions and from interviews with labor leaders. It is believed that it includes all the important aims of labor formulated up to Jan. 1, 1930.

The present program of the Japanese labor movement carries the agitation further along the same lines (see Table XLII). Where legislation has already been effected, it points out the need of amendment; where there has been no legislation, it formulates the problems needing regulation. The present program is more specific and more detailed than was the program of 1919, but it is essentially the same, pointing the way now, as then, to the adjustments of labor necessary to the changes in industry. The future program of social legislation may be considerably influenced by the development of the political labor movement. There is ahead the possibility of a strong and influential labor party, comparable to the British Labour Party, to direct the social legislation of the future.

THE UPWARD TREND OF WAGES

The improved conditions of labor have not been confined wholly to social legislation. Wages have also increased. They have not increased enough to destroy the cheap labor status of the Japanese worker, but they have increased sufficiently to offset price increases and constitute a real rise in the wage level for the worker. The trend of wages in the past three decades—the period of greatest industrial expansion in Japan—has definitely and decidedly been upward. There

TABLE XLIII.—A COMPARISON OF WAGES AND PRICES IN JAPAN, 1900–1927[1]

Year	General index of wages, Department of Agriculture and Commerce, 1900 = 100	Wholesale price index, Bank of Japan, 1900 = 100	General index of wages, Department of Commerce and Industry, 1921–1923 = 100	Wholesale price index, Bank of Japan, 1921–1923 = 100
1900	100	100		
1901	105	96		
1902	108	97		
1903	110	103		
1904	108	108		
1905	112	116		
1906	118	120		
1907	134	129		
1908	143	125		
1909	144	119		
1910	149	120		
1911	153	125		
1912	157	132		
1913	161	132		
1914	160	126		
1915	159	128		
1916	163	155		
1917	187	195		
1918	246	255		
1919	355	312		
1920	495	343		
1921	500	265	96	101
1922	. . .	259	102	99
1923	. . .	263	102	100
1924	. . .	273	104	104
1925	. . .	267	103	102
1926	. . .	237	103	90
1927	. . .	223	101	85

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[1] Wage index 1900–1921 from Department of Agriculture and Commerce, Statistical Report, 1905–1921. Wage index 1921–1927 by Department of Commerce and Industry in Financial and Economic Annual of Japan, *op. cit.*, 1928. Wholesale price index from Bank of Japan publication in Japanese.

is no very satisfactory index of wages stretching back as far as 1900, but sufficient data have been published to mark the general trend. The Japanese Department of Agriculture and Commerce constructed an index of average wages including factory industries, agriculture and household occupations from 1900 to 1921. This index, compared with the wholesale price index published by the Bank of Japan, shows the general average of wages to have kept pace with the rising prices over the early years of the century and to have considerably exceeded the price level at the peak in 1920 (see Table XLIII).

From 1921 to date, the Department of Commerce and Industry has continued the wage index with modifications excluding agricultural labor and including a few more industrial occupations not in the original index. This second index shows the general level of industrial wages to have been maintained in the years since 1921 above the average for 1921 to 1923. Prices, in the meantime, have experienced a drastic decline from the postwar peak, so that the real wages of labor have actually improved and very considerably. In Figure 121*c*, an adjustment of the later index published by the Department of Commerce and Industry has been made to the base of 1900, and the two indices have been charted as one in order to show the course of wages continuously since 1900. Throughout that period, the trend has been upward, and during the war and postwar years, 1917 to 1920, the increases were very great. The upward tendency has been maintained at a slower rate since 1920 but, as has already been stated, the decline of prices has effected a large increase in real wages.

Beginning with 1920, the Tokyo Chamber of Commerce has constructed an index of wages and an index of wholesale prices for Tokyo City, which tell the same story for wages as that related above: wages have maintained a level above the 1920 base while prices have declined considerably since then.[1]

The upward trend of wages in general is corroborated in the textile industries and in transportation, the specific industries for which data are available back to 1900. These two industries employ together about one-third of the industrial population of Japan and are the two elementary industries that have firmly established the machine economy in Japan. In the textile industries, the wages received by the female cotton spinner and by the female silk reeler may be regarded as representative of the wages paid in those industries. The silk and cotton industries are noted for their cheap labor and lack of labor organization, but in both cases there has been a considerable increase in the money wage of the workers during the past 30 years. In 1900, the female cotton spinner was earning, on the average, less than 10 cents a day.

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[1] *Japan Advertiser, Annual Review, op. cit.*, 1928–1929, p. 4.

In 1927, she averaged six times that wage or 57 cents a day. It is still cheap labor, but the increase from the level of 1900 has been relatively very great. Comparing the trend of the cotton spinner's wage with the price of raw cotton and the manufacturer's price on the finished yarn, it would appear that unit wage costs have increased much more than the unit cost of the raw material or the price of the finished yarn (see Figure 121*a*). Since the beginning of the upward swing of both prices and wages in 1916–1917, wages have climbed almost steadily while prices have experienced drastic declines from the postwar peaks.

The same thing is true in the silk industry. The female silk reeler was earning about 10 cents a day in 1900. In 1927, she was earning between 45 and 55 cents a day, five times the 1900 wage. The price of raw silk for the manufacturer has increased at a much slower pace (see Figure 121*b*). Wage costs in these two industries have increased, not only in money value, but also in relation to the return to the manufacturer on the finished product.

The average monthly earnings of the workers on government railways have been used as the basis for the index of transportation wages. It is an extremely conservative measure because government wages tend to lag behind the course of wages in private undertakings. Government wages are generally determined by an inelastic budget or schedule of wages and do not respond to changes in the labor market very readily. The earnings of government railway workers in Japan have increased in the past 30 years, but relatively not as much as wages in the textile industries. Nevertheless, they have kept pace with the increasing prices from 1900 through 1920 and have maintained the level of 1920 during the subsequent period of decline in prices (see Figure 121*d*). The fact that they are government wages has limited the effect that organized labor could produce toward higher standards of pay. Though the transportation industries are the most unionized of industries in Japan, being about 28 per cent organized and having about 40 per cent of the labor movement membership, the strength of the unions has been more in the municipal railways and bus lines than on the government railways and has had little effect upon the conditions of labor or rates of pay on the government railways.

Though the statistical measures of wage trends in Japan are few and unsatisfactory, there can be no doubt that money wages have made substantial gains since the beginning of the century and that the individual worker is costing the employer more in real wages. The transitional period of Japan's cheap labor has already begun. With the further development of industry, more changes will occur, just as they have already occurred in most of the industrial countries of the West.

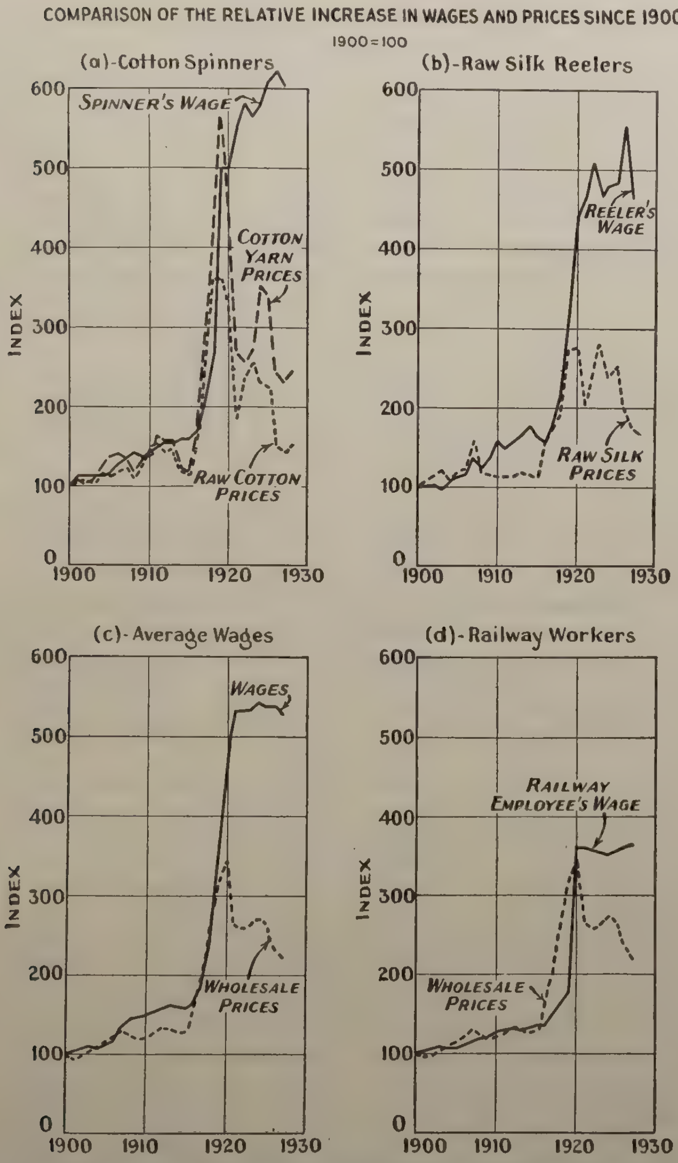

FIG. 121.—(*a*) The cotton spinner's wage has increased to a much greater degree than the price of raw cotton or of cotton yarn. (*b*) The price of raw silk has not kept pace with the increase in the wage of the silk reeler. (*c*) The general level of wages has been maintained at the postwar levels as prices have declined. (*d*) The wage of the government railway worker has increased, but not to the same extent as the general level of wages.[1]

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[1] Data from Financial and Economic Annual of Japan, *op. cit.*, 1921–1928; Statistical Report of Department of Agriculture and Commerce, *op. cit.*, 1905–1921; Japan, Department of Railways, Annual Report, 1926; Bank of Japan, Index of Wholesale Prices.

What part the labor movement has played in raising the standards of pay for the workers is difficult to say. In the specific industries cited, it was practically nil. In other industries, the influence of the movement has perhaps been more direct. Between the years 1914 and 1929, there have been some 6,352 organized labor disputes in Japan and of this number 53 per cent were over the question of wages. The remaining 47 per cent concerned working hours, discharge allowances, freedom in dormitories, better food in dormitories, troubles with supervisors, method of calculating wages, and recognition of unions.[1] The official record does not state how many of these disturbances resulted in victory for the strikers, but the largest number of workers to be concerned in these disputes in any one year was 125,894 in 1926. It is not a large number. There were also instances, however, where the union's demand for increased wages was met without the necessity of a strike.

It is very probable that the labor movement has not been the chief cause of the increase in wage standards. It has been too small and too much disrupted by internal strife. Its energies have had to be used in establishing its right to exist and in organizing the workers rather than in making substantial gains in their earning capacity. Other forces have been more potent in establishing new wage levels, especially the changing economic conditions due to the growth of industrialism that have raised the standards of labor in other industrial lands.

THE CONTRIBUTIONS OF LABOR TO RATIONALIZED INDUSTRY

In a previous chapter, the increased efficiency of Japanese industry through the introduction of improved machinery and modern technique has been discussed. It is a movement that inevitably will have an important effect upon the status of the worker—his wages and his conditions of labor. What part the labor movement of the future will play in this rationalization of industry is uncertain. There are two courses open: labor may resist the changes, put obstacles in the way, fight the rationalization of industry; or it may cooperate with the management in bringing about a revolution in methods. It may go even further and point the way to reorganization. There is the spectacular instance of a labor union pointing the way to management in the men's clothing industry in the United States. That union and its methods have been studied by labor leaders from Japan. It is not impossible that the Japanese labor movement may develop along those lines in the future. The new unionism in America is summed up in the following statement by President Hillman of the Amalgamated Clothing Workers of America, and it represents a point of view that is being taken by other labor unions more and more. Mr. Hillman has said:

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[1] From the reports of Japan, Bureau of Social Affairs on labor disputes, as published in *Industrial and Labour Information*, *op. cit.*, and *Trans-Pacific*, *op. cit.*

> It is necessary not only to harass and to annoy our enemies, the open shop employers, but it is also important that the union policy toward the employers who deal with our organization be such as not to drive them into the non-union field nor force them into liquidation. . . .
>
> We must maintain our standards. We must strive to raise these standards whenever an opportunity presents itself. These are the ends for which we are organized and which lead toward the making of a better industry. While this policy is being pursued and accomplished, the union is obliged to cooperate with the employers in maintaining the highest efficiency compatible with the maintenance of union standards. It becomes the duty of the union to state the needs as well as the problems of the industry, and in pursuing the realization of its program, to demand only those things which will be of real benefit to the membership.
>
> . . . The union cannot take the position of an outsider in relation to the industry; it must fight for a place in the councils of industry, a place of power as well as responsibility.
>
> . . . Of the actual processes of manufacturing the union has greater knowledge than the individual employer. In numerous instances, therefore, it has been possible for the union through its experts to point out actual shortcomings in the manufacturing process and show the way toward real improvement.
>
> . . . For instance, through the introduction of proper employment methods and in supplying the employer with the kind of help he needs, the union cuts costly turnover of labor.[1]

This is a statement of the policy actually pursued by the union, not a theory of what should be done. It has been put into practice in America and it is, therefore, not impossible for Japan. The Japan Seamen's Union has already begun to function along similar lines in bringing about the establishment of the Joint Maritime Board for the arbitration of disputes between shipowners and seamen, in bringing about the operation of a national system of free employment exchanges for seamen, and in the establishment of a minimum scale of wages for seamen on most Japanese ships. It is now working for the establishment of standards in the manning of crews and the execution of seamen's insurance. The other labor unions in Japan have so far approached the probem of rationalization only in the most abstract fashion. What influence they will wield in the future depends very much on what policy they decide to adopt to meet the inevitable changes in industry.

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[1] SIDNEY HILLMAN, General President, Amalgamated Clothing Workers of America, "The Problem of Employment in the Clothing Industry," published in *The Advance*, official organ of the Amalgamated Clothing Workers of America, New York, Aug. 5, 12, 26, 1927.

Labor is the major industrial resource of Japan and any industrial expansion that the country is able to accomplish must be based upon its effective use. Today, labor is inefficient, dependent, unskilled, and unreliable for industrial purposes. If industry is to advance along western lines, these faults must be remedied, and if they are remedied, labor cannot long remain cheap. The changes in the status of Japanese labor have already begun. They will necessarily proceed slowly and their progress will depend upon three fundamental changes in the existing attitude toward labor: First of all, the Japanese government must become as sensitive to the needs of labor as it now is to the needs of industry; then, the Japanese employers must abandon their blind faith in cheap labor and base wages and working conditions upon a scientific study of human needs and human efficiency; and, finally, the labor movement must end internal dissensions over social theories, apply itself to the task of organizing labor on a large scale, and equip itself to participate in the councils of industry for the intelligent coordination of the functions of labor and the functions of management. All three changes are occurring. The Japanese government in one way or another is coming to recognize the needs of labor; the Japanese employers have begun to talk of rationalization; and one Japanese labor union, at least, has won a small place in the councils of industry. Only by the best use of her labor can Japan hope to produce manufactured goods which can enter into world trade to pay for the import of the necessary raw materials and food.

CHAPTER XXIII

THE DEPENDENCE OF INDUSTRIALIZATION UPON FOREIGN TRADE

THE progress of Japanese industrialization depends very largely upon the country's ability to expand the foreign trade. The modern industries that have developed are dependent essentially upon foreign sources for their raw materials or upon foreign markets for the disposal of their products, and in some cases upon foreign countries for both the raw materials and the markets. The cotton spinning industry imports practically all of its raw cotton. The woolen industry imports about three-fourths of its raw wool. The iron and steel industry imports over 90 per cent of the iron ore consumed and nearly half of the pig iron. The engineering industries import machine tools. Wood and chemicals are imported as raw materials for various important industries. Foods must be imported; fertilizers must be imported. Japan is poor in raw materials and has little besides her labor on which to build her industrial system.

The modern industries must export a large part of their production. The raw silk industry obtains its raw material from within the country, but it is almost completely dependent upon the export trade for the disposal of its product. Eighty-two per cent of the raw silk production—an amount equal to 88 per cent of its value—is exported abroad. The remaining raw silk of lower unit value goes into the domestic silk tissue industry, and 26 per cent of the value of the resulting silk tissues is also exported. The cotton textile industry looks to foreign markets to dispose of nearly 60 per cent of the value of its product. Tea and ceramics, industries of lesser importance, depend upon the export trade for the disposal of more than one-third of their production.[1]

THE UNFAVORABLE BALANCE OF TRADE

From the very beginning of her industrial career, it has been a constant struggle for Japan to balance her imports with her exports;

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[1] The estimates of foreign dependence in these paragraphs are based upon official data published in the Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, in the Statistics of the Department of Commerce and Industry, *op. cit.*, and the Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.* The estimates of iron ore and pig iron are based on Raw Materials Entering into the Japanese Iron and Steel Industry, *op. cit.* Estimates of the consumption of raw wool were obtained from the Mitsubishi *Monthly Circular*, *op. cit.*, March, 1928.

and the struggle has become greater, not less, with the industrialization of the country and the growth of population. From 1868 to 1895, the balance was nearly even. There was an excess of imports of merchandise in half of the years and an excess of exports in the other half, but the imports exceeded the exports for the period by about 12,267,000 yen.[1] Following the China-Japan War in 1894–1895, the war which first stimulated industry and which marks the real beginning of progress in the modern industrial era, there has been an almost continuous excess of imports over exports of merchandise. In only 6 of the 33 years since 1895 has the balance of trade been favorable to Japan and 4 of the 6 years were the extraordinary war years from 1915 to 1918 when Japan was called upon to supply markets normally trading with Europe or America. This trade was tremendous, but it was not permanent. Since 1919, imports have exceeded exports in every year and by very large amounts. From the China-Japan War up to the World War, the excess of imports amounted to 928,803,000 yen. The first three years of the war trade, 1915, 1916 and 1917, canceled this deficit, and by the end of 1918, Japan's foreign trade account showed a surplus of 466,978,000 yen. With the end of the war and the return of the other nations to normal trade relations, Japan's export trade fell off and there was an immediate excess of imports in 1919. In the first five postwar years, the deficit in the trade balance exceeded the enormous surplus of the four war years, and from 1918 through 1929, the excess of imports of merchandise totaled more than 3,336,020,000 yen. For the entire period of foreign commerce including 1929, the unfavorable balance of trade was 2,869,042,000 yen (see Figure 122). This unfavorable trade balance for Japan is part of a vicious circle of economic endeavor wherein the poverty of resources necessitates the import of raw materials; the excess of imports stimulates industry to develop an export trade in order to balance the account; and this development of industry for supplying export products increases the import demand still further.

In the invisible trade, however, Japan has had a favorable balance in the recent years for which data have been published. The invisible trade of the nation includes such items as the returns on Japanese investments abroad and on foreign capital invested in Japan, income from shipping and from insurance, and expenditures of foreigners in Japan and of Japanese in foreign lands. For the period 1923 to 1928, the receipts in the invisible trade averaged yearly 246,667,000 yen in excess of payments, and shipments of specie and bullion averaged 16,578,000 yen in excess of imports, but for the same period, the average yearly imports of merchandise exceeded exports of merchandise by 365,310,000 yen, leaving an uncovered and adverse yearly net balance of 102,065,000 yen in spite of the favorable balance of the invisible

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[1] The Japanese unit of currency has been retained in this discussion because of the difficulty of converting the yen to dollars in the early years of the trade. Prior to December, 1885, the yen contained 0.048 troy ounces of gold and had a par value of approximately $1, U. S. currency. From January, 1886, to September, 1897, the yen contained 0.8 troy ounces of silver and its gold value fluctuated with the declining prices of silver from about $0.80 in 1886 to about $0.49, U. S. currency in 1897. Since October, 1897, the yen has contained 0.024 troy ounces of gold and the par value has been $0.498, U. S. currency. Due to the greater gold value of the yen, the earlier figures are not strictly comparable with the later ones.

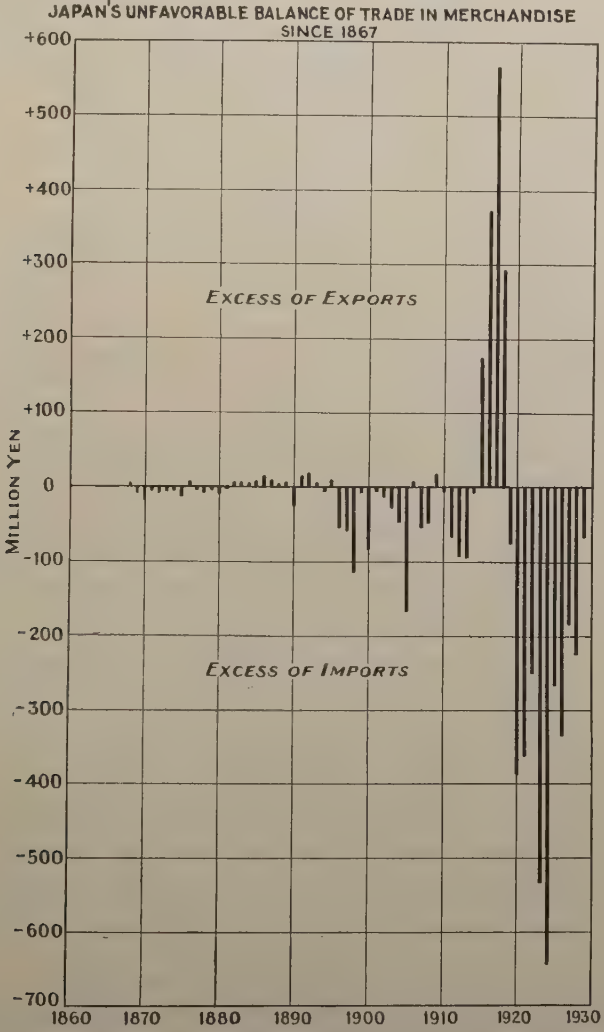

FIG. 122.—The excess of imports has been especially marked since the World War. (One yen equals $.498, gold.)[1]

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[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

trade (see Table XLIV).[1] The deficit has been met, in part at least, by foreign loans. Since 1870, the national government has borrowed abroad 2,500,000,000 yen, only 1,000,000,000 yen of which had been repaid by the end of 1929.[2]

TABLE XLIV.—EXCESS OF IMPORTS IN JAPAN'S VISIBLE AND INVISIBLE TRADE, 1923 TO 1928

Year	Japan Proper,[1] yen	Japan, Taiwan, and Korea,[2] yen
1923	145,000,000	....
1924	230,000,000	310,000,000
1925	27,000,000	116,000,000
1926	119,000,000	232,000,000
1927	85,000,000	....
1928	6,000,000	....
Average..........	102,000,000	219,000,000

[1] Based on data for Japan Proper in Financial and Economic Annual of Japan, *op. cit.*, 1928; Annual and Monthly Returns of the Foreign Trade of the Empire of Japan, *op. cit.*, and *Trans-Pacific*, *op. cit.*, p. 19, Jan. 16, 1930.

[2] From statement required by the League of Nations and including the foreign trade of Taiwan and Korea in Financial and Economic Annual of Japan, *op. cit.*

DOMINANT POSITION OF RAW MATERIALS IN THE IMPORT TRADE

The problem of the unfavorable trade balance is a really serious one for Japan. The nation lacks within her own borders either actual or potential reserves of many of the important materials for manufacturing industry. Under the program of industrialization that has been undertaken by the nation, there can be no significant reduction in the volume of imports. Raw materials and materials for further manufacture now constitute nearly 70 per cent of the value of the import trade. Half of the remaining 30 per cent is in manufactured goods, a great part of which would have to be replaced by raw materials or by semi-manufactures if their import were reduced or eliminated (see Table XLV). Foods constitute the remaining 14 or 15 per cent of the imports. The nation cannot expect to become wholly independent of foreign supplies of food. While Japan does export some foodstuffs, she imports on the average two and one-half times as much as she exports, and the volume of her food imports is steadily increasing. Already, the limit of arable land is being approached, and intensive cultivation is being practiced and has been practiced for centuries. Science may discover new methods of farming or increase the yields of the soil, but in the meantime the population is increasing at a very rapid rate. The government is seeking every avenue of relief, but the probability is that Japan will have to import more and more foodstuffs.

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[1] For the years 1924 to 1926, the government has published another estimate of the balance of international payments, according to the form used by the League of Nations and including the trade of Taiwan and Korea as well as Japan Proper. This statement, which also includes the invisible items of trade, shows a yearly average adverse balance for the Empire of 219,000,000 yen—a deficit much greater than the estimate for Japan Proper.

[2] Estimated from the annual statements of the national debt published in Financial and Economic Annual of Japan, *op. cit.*, 1900–1928, and *Trans-Pacific*, *op. cit.*, p. 20, Apr. 24, 1930.

TABLE XLV.—MAJOR CLASSES OF JAPAN'S FOREIGN TRADE[1]
(Based on the five-year average, 1923 to 1927)

Classes	Percentage of total value	
	Imports	Exports
Foods	14.4	6.7
Raw materials	53.6	6.5
Semi-manufactures	16.0	45.7
Wholly manufactured goods	15.4	40.0
Other	0.6	1.1
Total	100.0	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1923–1927.

Of the raw materials imported, raw cotton is the chief and foremost (see Table XLVI). It represents between 29 and 30 per cent of the whole import trade, an amount that cannot be reduced by any expansion of the home supply. There is no land available in Japan for extensive cotton growing. The pressure of population and the much greater need to grow food have already displaced cotton from the agriculture of the nation (see Figure 5). It is not likely to return. The possibility of growing cotton in Korea is also limited by the arable area and the density of the population. Cotton from Manchuria, if the Japanese are successful in carrying out their present plans for developing cotton plantations there, still will not constitute a home supply, since Manchuria is Chinese territory, and will not reduce imports from India and the United States by more than 10 or 20 per cent. The textile industry is the great industry of the nation, and the expansion of exports depends very largely upon the increased production of cotton goods; but increased production of cotton goods depends upon increased imports of raw cotton. The nation cannot expect to decrease this item of the import trade.

Some reductions may be effected in the imports of woolen yarn and woolen tissues which now represent 4 per cent of the total imports and about one-half of the imports of wool and wool manufactures. But unless some new domestic source of raw wool is developed, any reduction of yarns and tissues must be replaced, as in the past, by an

TABLE XLVI.—IMPORTANT JAPANESE IMPORTS OF FOREIGN MERCHANDISE[1]

(Five-year averages in thousand yen)

Years	Raw cotton	Cotton textiles	Wool and wool manufactures	Food	Iron ore	Pig iron	Iron and steel	Machinery	Timber	Petroleum	Manures	Drugs and chemicals	Total	Grand total
1876–1880	287	10,972	5,093	3,756	....	44	1,208	424	24	1,288	75	721	23,892	30,735
1886–1890	2,793	13,895	5,649	10,604	....	193	2,738	2,188	45	3,457	198	1,438	43,198	57,901
1896–1900	48,724	20,497	16,163	45,849	....	997	13,636	9,025	507	8,726	5,362	6,252	175,738	234,899
1906–1910	111,218	18,569	27,918	64,069	1,090	3,974	28,724	23,260	1,517	15,151	23,591	18,436	337,517	440,578
1916–1920	502,385	9,935	81,265	169,611	8,968	41,200	177,692	60,878	10,791	19,788	100,668	92,379	1,275,560	1,585,915
1924–1927	719,797	11,710	193,939	360,245	8,666	23,100	116,363	96,650	103,410	61,209	117,000	133,271	1,945,360	2,392,630
						Percentage of total value								
1876–1880	0.9	35.7	16.5	12.2	...	0.1	3.9	1.4	0.1	4.2	0.2	2.3	77.5	100.0
1886–1890	5.1	24.0	9.7	18.3	...	0.3	4.7	3.8	0.1	6.0	0.3	2.5	74.8	100.0
1896–1900	20.8	8.7	6.9	19.5	...	0.4	5.8	3.8	0.2	3.7	2.3	2.7	74.8	100.0
1906–1910	25.2	4.2	6.3	14.5	0.2	0.9	6.5	5.3	0.3	3.4	5.3	4.2	76.3	100.0
1916–1920	31.6	0.6	5.0	10.7	0.6	2.6	11.2	3.8	0.7	1.2	6.3	5.8	80.1	100.0
1924–1927	30.0	0.5	8.0	15.1	0.4	1.0	4.9	4.0	4.3	2.6	4.9	5.6	81.3	100.0

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[1] Computed from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.* The present par value of the yen is $.498; for earlier values see also note, p. 420.

increase of raw wool imports. Sheep growing is not an industry for densely populated lands, and the mountain pastures of Japan cannot be used effectively because of the native bamboo grass which is fatal to sheep. Its hard, serrated edges are said to cut the entrails of the sheep and produce an inflammation of the stomach.[1] Experiments in replacing the native grass by more nutritious clovers have not been very successful. The possibility of growing extensive supplies of raw wool in Hokkaido, the north island, has not been fully tested. There may be some addition to the home supply from this source, but it will take many years to become significant in the home industry. The number of sheep in Japan at the end of 1928 was less than 20,000.[2] It is doubtful if the nation can ever become wholly independent of foreign supplies of raw wool for any extensive woolen manufacturing industry.

Industrialization in the western sense of the word means the increased consumption of iron and steel and their products. In an earlier chapter, it has been pointed out that Japan is essentially dependent upon foreign sources for the raw materials of her steel industry. Machine tools, iron and steel, pig iron and iron ore constitute 10 per cent of the total imports. The ore and pig are less than 2 per cent; the 8 per cent are partially or wholly fabricated products of iron and steel. To replace these imports by their raw materials will necessitate a tremendous expansion of the home industry that has hardly been justified by past performance. The steel industry in Japan has been an expensive and discouraging chapter in her industrialization and it is not probable that it will ever be able either to secure sufficient raw materials within the country or to produce a surplus of iron and steel goods for export to pay for the imports of the raw materials.

Drugs and chemicals constitute a little less than 6 per cent of the total imports, and organic manures about 5 per cent. In neither of these items is there any prospect of any immediate or permanent reduction in the volume of imports. The classification—drugs and chemicals—contains a great variety of products that are imported in small quantities. The largest items in this class are rubber, a raw material which is not produced in Japan, and sulphate of ammonia and nitrate of soda, both of which are being imported in increasing amounts for fertilizers. The importance of agriculture to the nation, the increasing pressure of the population on the food supply, and the low fertility of all but the youthful alluvial soils will probably necessitate an increase rather than a decrease in the import of fertilizers both organic and chemical.

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[1] ELLEN CHURCHILL SEMPLE, "Influence of Geographical Conditions Upon Japanese Agriculture," *The Geographical Journal*, Royal Geographical Society, Vol. 40, No. 6, pp. 589–608, December, 1912.

[2] Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, p. 37, 1928.

Of the remaining imports, petroleum and timber are the only ones of outstanding importance and both are raw materials. They represent together nearly 7 per cent of the total. The petroleum resources of Japan are extremely meager, and the nation is dependent upon imports for from 70 to 75 per cent of the present consumption.[1] Timber imports amount to about 4 per cent of the import trade and supply one-third of the present Japanese consumption.[2] The rest of the import trade, excluding foods, is less than 20 per cent of the total and is in small quantities of a great variety of merchandise of which dyestuffs and metal manufactures are the largest individual items, representing between 2 and 3 per cent of the total imports. With the aid of government subsidies and import prohibitions, it is probable that the dye industry may be able to supply completely the home demand in the near future. Progress in metal manufactures will be much slower because of lack of raw materials and mechanical skill.

It probably would be possible, under severe government regulation, to reduce the volume of Japanese imports, but not without the sacrifice or curtailment of the industrialization program. Manufactured goods have already been largely eliminated from the import trade. The great bulk of the trade is in materials necessary to the expansion of industry that cannot be produced as economically at home.

It is to the expansion of her export trade rather than to a reduction of imports that Japan must look for a favorable balance of trade. Of all the imports of raw materials and materials for further manufacture, only raw cotton serves as the basis for a manufacturing industry producing commodities in any considerable quantity for export from the country. The rest of the import trade is essentially for consumption within the country. If the trade is to be balanced, other industries must produce a surplus for export.

THE IMPORTANCE OF SEMI-MANUFACTURES IN THE EXPORT TRADE

The burden of balancing international trade now falls upon two industries—silk and cotton textiles (see Figure 123). Raw silk, silk tissues, cotton yarn, and cotton tissues constitute between 65 and 70 per cent of the export trade. Raw silk alone constitutes nearly 40 per cent of the exports, cotton textiles nearly 25 per cent, and silk tissues about 6.5 per cent (see Table XLVII). Raw silk has been the major export of the country since the beginning of foreign commerce. In the first years of the trade, it constituted over 35 per cent and in the succeeding years, it has continued to be the chief export.

[1] Based on data in Mitsubishi *Monthly Circular*, *op. cit.*, p. 20, May, 1928.

[2] Estimated from data in the Statistical Abstract of the Ministry of Agriculture and Forestry, *op. cit.*, and the Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

TABLE XLVII.—IMPORTANT JAPANESE EXPORTS OF DOMESTIC MERCHANDISE[1]
(Five-year averages in thousand yen)

Year	Raw silk	Silk tissues and manufactures	Cotton textiles	Clothing	Pottery and glassware	Aquatic products	Paper and paper manufactures	Coal	Tea	Matches	Copper	Sugar	Total	Grand[2] total
1876–1880	10,705	19	22	16	245	1,890	63	355	5,811	.....	898	.....	20,024	26,347
1886–1890	23,124	2,547	176	144	1,330	3,271	298	1,648	6,787	938	3,347	.....	43,610	57,908
1896–1900	50,137	17,615	21,439	1,300	2,498	4,261	1,375	10,458	7,997	5,711	8,743	.....	131,534	170,814
1906–1910	125,270	36,800	52,840	10,847	8,361	8,233	5,246	17,433	12,447	10,369	23,854	5,893	317,593	417,631
1916–1920	425,187	117,516	347,410	80,788	36,895	14,961	28,957	32,358	19,282	26,970	51,514	28,883	1,210,721	1,722,819
1924–1927	780,149	134,848	488,736	62,557	46,347	21,971	24,583	28,033	12,639	6,600	2,466	33,336	1,642,165	1,969,174
Percentage of total value														
1876–1880	40.7	0.1	0.1	0.1	0.9	7.2	0.2	1.3	22.1	....	3.4	...	76.1	100.0
1886–1890	40.0	4.4	0.3	0.2	2.3	5.6	0.5	2.8	11.7	1.6	5.8	...	75.2	100.0
1896–1900	29.4	10.3	12.6	0.8	1.5	2.5	0.8	6.1	4.7	3.3	5.1	...	77.1	100.0
1906–1910	30.0	8.8	12.7	2.6	2.0	2.0	1.3	4.2	3.0	2.5	5.7	1.4	76.2	100.0
1916–1920	24.6	6.8	20.1	4.7	2.1	0.9	1.7	1.9	1.1	1.6	3.0	1.7	70.2	100.0
1924–1927	39.6	6.8	24.8	3.2	2.4	1.1	1.2	1.4	0.6	0.3	0.1	1.7	83.2	100.0

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[1] Computed from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.* The present par value of the yen is $.498; for earlier values see note, p. 420.

[2] Total exports minus reexports.

In terms of national economy, the raw silk trade is uneconomic for Japan. It is a trade in a semi-manufacture, almost a raw material. Japan is a nation with a chronically unfavorable balance of trade, whose industrial future depends upon her ability to sell labor, not raw materials, in the international markets. But over 80 per cent of the output of raw silk, the only important industrial raw material of the country, is exported in a semi-raw state, while the government carries on a program of industrialization which requires government assistance and subsidies to all kinds of industries for which there are no substantial resources of raw materials within the country. The raw silk industry has brought wealth to the producers and to Japan, but the export trade has been a dissipation of a resource that might have been the basis for a silk tissue industry of large proportions.

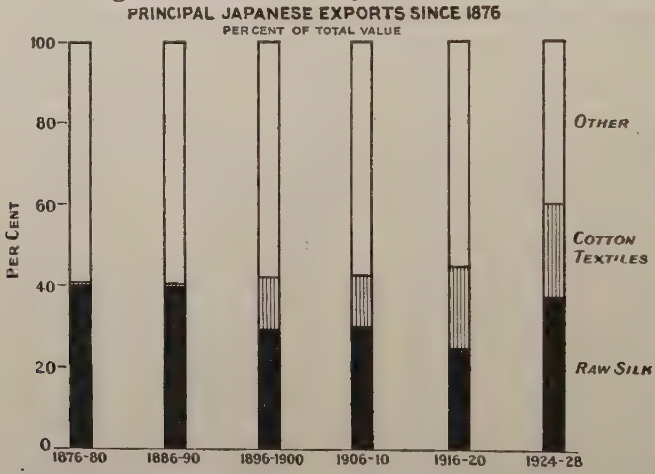

FIG. 123.—Raw silk and cotton textiles provide the basis of Japan's export trade.[1]

Silk tissues now stand third in importance in the Japanese exports, but they constitute less than 7 per cent of the total value. The other silk manufactures are a negligible quantity in the foreign trade. The obvious course for Japan to follow would seem to be the development of the manufacture and the export of silk tissues and other silk goods to absorb the raw silk now being sent out as raw material, but there are a number of obstacles in the way of such an expansion. The part played by tariffs, distance and cultural differences in limiting the markets for Japanese silk goods has been pointed out in a previous chapter. The United States is the greatest silk consuming nation of the world, but an almost prohibitive tariff against the importation of silk manufactures has been established, and the import demand is for raw silk. The United Kingdom is the largest importer of silk tissues, but distance and differences in culture limit Japan to a very small share in that trade. Australia, the largest consumer of Japanese silk tissues, takes 21 to 22 per cent of the silk tissue export of Japan (see Table XLVIII). It was rapidly growing as a market for the Japanese product until the Australian tariff duties on silk and artificial silk were made prohibitive, going as high as 50 per cent of the value on some classes of silks. Exports immediately declined in 1928 and continued to drop in 1929, and the hope that this market held out to Japanese producers has been considerably weakened. Canada, another important market for Japanese silks, taking about 9 per cent of the silk tissue export, has also imposed a high tariff on silk cloth, amounting to about 35 per cent of the value. Before the imposition of this tariff in 1928, Japan was supplying about 18 per cent of the import demand for silk tissues in Canada. In 1928, exports began to decline, and in 1929, they had decreased nearly 19 per cent from the previous annual average. Although the silk tissue industry seems to be a logical and a necessary development in the successful industrialization of Japan, the possibilities for the expansion of the export trade in this commodity are not very promising. The Japanese producers have turned their attentions to British India in recent years, and since 1926, exports of silk tissues to that market have increased markedly.

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[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

TABLE XLVIII.—JAPANESE EXPORTS OF SILK TISSUES[1]

(Five-year average, 1925 to 1929)

Destination	Thousand dollars, gold	Percentage of total
Australia	14,226	21.2
United States	9,560	14.2
United Kingdom	7,040	10.4
British India	8,228	12.2
Canada	6,122	9.1
France	4,240	6.2
Total	49,416	73.4
Grand Total	67,368	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927, and Mitsubishi *Monthly Circular*, *op. cit.*, February, 1930.

The Threats to the Raw Silk Exports

Aside from the fact that raw silk is a semi-manufacture, the trade is economically dangerous for Japan because this one product dominates the export trade and places the nation in the position of having too many eggs in one basket. Raw silk constitutes nearly 40 per cent of the export trade and over 95 per cent of the commodity goes to the United States (see Table XLIX). A luxury trade with one market is not a substantial basis for industrialization. Dependent upon one commodity and one market, the stability of the nation is endangered by any threat to either—and there are two dangers threatening the raw silk trade of Japan—the development of artificial silk and the growth of a silk industry in China. Neither can be dismissed lightly as a fanciful bugaboo.

Japanese silk producers contend that rayon is not a competitor of raw silk, and they point to the increasing export of raw silk to prove that rayon has not made serious inroads upon their markets. The years from 1923 to 1929 were years of unusual prosperity in America, and therefore of great demand for silk. It is a question whether or not without rayon there would not have been an even greater consumption of the Japanese product. It is true that in the same period the Japanese silk market was glutted on several occasions and that the government was obliged to provide financial assistance to the producers. The product of the rayon industry is constantly improving, and it is being utilized for many purposes for which silk, as well as cotton, was formerly used. If the present progress in its perfection is continued, its uses are bound to multiply. It has had one effect upon the prices of Japanese raw silk admitted by Japanese exporters: no longer is it possible for prices of the natural product to rise to very high peaks in periods of deficient supply, for the buyers promptly turn to rayon. The substitution of rayon during periods of high prices suggests the possibility, at least, of its substitution at any time, certainly if its costs of production are reduced. It is a repetition of the oft-repeated struggle between a natural product and an artificial one, and raw silk may be as completely eclipsed by artificial silk as natural indigo has been by the synthetic product.

TABLE XLIX.—JAPANESE EXPORTS OF RAW SILK[1]

(Five-year average, 1925 to 1929)

Destination	Thousand dollars, gold	Percentage of total
United States	369,804	95.6
France	12,831	3.3
Others	4,026	1.1
Total	386,661	100.0

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927, and Mitsubishi *Monthly Circular*, *op. cit.*, p. 18, February, 1930.

The other threat to Japanese raw silk is also very real. If China turns her attention seriously to the raw silk industry, and there has been a decided movement in that direction in recent years, she has vastly wider areas suitable for the cultivation of the mulberry and the silkworm than has Japan. She probably produces more silk than does Japan, but her methods have not been uniform, and American manufacturers have preferred the more even quality of the Japanese silk. Now, however, schools of sericulture are being established in China and modern methods of reeling are being adopted by Chinese reelers. Plans have been formulated by the Chinese Ministry of Industry, Commerce, and Labor for an examination and testing bureau for silk in Shanghai.[1] The Chinese product is being improved and exports to the United States are increasing, so much so, in fact, that the Japanese silk reelers have become anxious, and the Japan Central Silk Society in July, 1929, dispatched officials to China to study the situation.[2] It is quite possible that within the next few years the same improvements that Japan has effected may be introduced into China. China will then become a serious competitor of Japan in a trade that comprises nearly half of Japan's exports. Though Japan now has virtual control of the world trade in raw silk, her share being estimated at 60 to 65 per cent[3] of the total, she cannot be assured of maintaining that control unchallenged in the future. That the Japanese leaders realize these difficulties is evident from the statements made before a meeting of the Silk Yarn Commission at the Ministry of Agriculture and Forestry in July, 1927. The chief of the Silk Yarn Bureau is quoted as saying at that time:

> The silk industry is yearly making so much development that it not only occupies a position of great importance among the industries of the country, but is charged with the important duty of maintaining the balance of foreign accounts of the country. To look into the details of the industry, however, it will be found that it has many drawbacks in the way of management and technique. Due to these drawbacks, the industry lacks steadiness in foundation and is liable to call for urgent remedial measures. Considering the development of the artificial silk industry abroad, there is no alternative but to supply the best possible quality at the lowest possible price in order to extend the market for Japanese raw silk abroad. If the silk industry is left to drift by itself, it is to be feared that it will become unable to make both ends meet and eventually decay. Considered from the view-point of the future of the export trade of the country, the remedy of the drawbacks of the silk industry can brook not even a moment's delay. It is imperative to closely investigate all matters

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[1] *Chinese Economic Bulletin*, *op. cit.*, June 1, 1929.

[2] *Trans-Pacific*, *op. cit.*, p. 20, July 11, 1929.

[3] See Table IX, p. 210.

> relative to the industry, such as the cultivation of the mulberry trees, sericulture, the nursing of mulberry seedlings, reeling, transactions in cocoons, credit facilities, etc., and lay down adequate measures to develop and improve the industry.[1]

At the same meeting, the Minister of Agriculture and Forestry voiced the warning that China has ample possibilities for the development of the silk industry, large areas suitable for the cultivation of mulberry and for sericulture, and quantities of cheap labor. He is reported as saying:

> The present growth of the export of our raw silk is to be attributed chiefly to the fact that supplies by other silk producing countries of the world—France, Italy, and China—have hitherto fallen far short of meeting the ever growing demand in Europe and America. It cannot be explained simply by efforts exerted by those concerned here to improve the industry. In fact, foreign consumers of Japanese raw silk often complain about deterioration of its quality. Its reputation is always below that enjoyed by French, Italian, and Shanghai descriptions.[2]

THE INCREASING IMPORTANCE OF COTTON GOODS EXPORTS

The other major prop of Japan's export trade is cotton (see Figure 123). Cotton textile exports have been increasing in importance steadily since the China-Japan War when they were less than 2 per cent of the value of the export trade. They now form nearly one-fourth of the total value. The future of the cotton industry in Japan depends upon increasing this trade to yet greater proportions. The home market is already 97 per cent supplied.[3] It is to the export trade that the industry must look for expansion. The industrial hopes of the nation lie in the cotton goods trade. It does not have the disadvantages that burden the silk trade. It is a staple, not a luxury trade, and the shift from the semi-manufactured yarn to the finished cloth has been almost completed. At the time of the war with China, four-fifths of the cotton exports were yarns. Now, it is just the reverse—over four-fifths of the cotton exports are tissues, and exports of yarns are continuing to decrease. The raw material must be imported from abroad, but the industry is not dependent upon one source of supply. Any shortage in the Indian crop can be supplemented by purchases from America and China and *vice versa*. Similarly, no one market is depended upon to absorb the whole of the finished goods. Although about 46 per cent of

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[1] *Japan Financial and Economic Monthly*, *op. cit.*, p. 17, August, 1927.

[2] *Op. cit.*

[3] A four-year average, 1924–1927, estimated from official data on production and trade published in Statistics of the Department of Commerce and Industry, *op. cit.*, 1927, and the Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

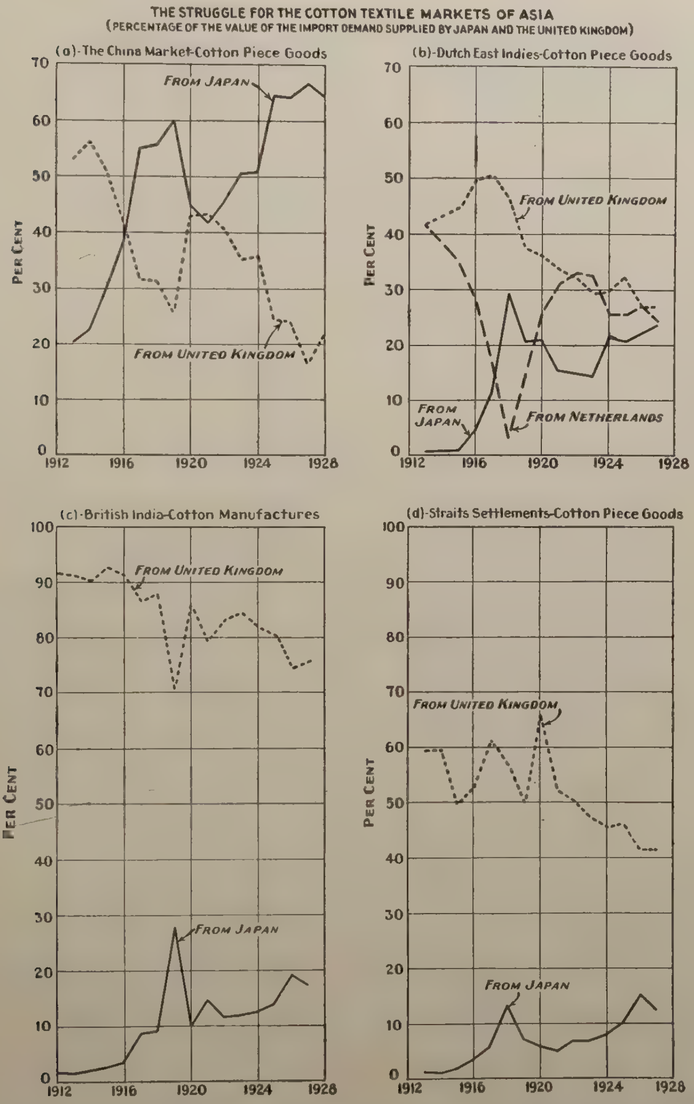

FIG. 124.—(*a*) In the China market, Japan has replaced the United Kingdom as the principal source of cotton piece-goods imports. (*b*) The United Kingdom has had to share the piece-goods market of the Dutch East Indies with both Holland and Japan. (*c*) The United Kingdom continues to be the principal source of the British East Indian imports of cotton manufactures. (*d*) In recent years, Japan has been supplying an increasing share of the piece-goods imports of the Straits Settlements at the expense of the United Kingdom.[1]

[1] Data from U. S. Department of Commerce, Handbook of China, 1926; Foreign Trade of China, *op. cit.*, 1923–1928; Departement Van Landbouw Nijverheid en Handel Jaaroverzicht, In-En Uitvoer Van Nederlandsch Indie, 1925–1927; Statistick Van Den Handel En De In-En Uitvoerrechten in Nederlandsch Indie, 1916–1923; Statistical Abstract for British India, *op. cit.*, 1913–1927; Straits Settlements Returns of Imports and Exports, 1913–1927.

the cotton textile exports go to China alone and 34 per cent to the rest of Asia, as is shown in Table L, this market is more diversified than the American raw silk market which takes over 95 per cent of the raw silk exports.

TABLE L.—JAPANESE EXPORTS OF COTTON TEXTILES[1]
(Four-year average, 1924 to 1927)

Destination	Thousand dollars, gold	Percentage of total
China, Hong Kong, and Kwantung	110,156	46.0
Rest of Asia....................	81,005	33.8
Total Asia......................	191,161	79.8
Grand total.....................	239,644	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927.

Japan has also the advantage of proximity in culture and in distance to the Asia market which is the great cotton textile market of the world. In eastern and southern Asia live over half the world's inhabitants, consuming probably two or three times as much cotton goods as the home industries produce. This market was for many years supplied by the industrial nations of Europe, especially by Great Britain whose long experience with the Oriental trade goes far toward counteracting Japan's advantage of proximity. But the World War gave Japan her chance, and the trade in Japanese cotton goods was increased tremendously all through Asia. Some of this gain was temporary, and the trade returned to the European nations as soon as they were able to supply the goods, but a large part became permanent. In China, Japan's share of the piece-goods import trade rose from 20 per cent in 1913 to over 60 per cent in 1923 to 1927. In India, it rose from less than 1 per cent in 1913 to nearly 11 per cent in the five years 1923 to 1927. In the Dutch East Indies, Japan supplied less than 1 per cent of the cotton goods imports in 1913 and averaged over 20 per cent in 1923 to 1927; and in the Straits Settlements, the increase was from 1 per cent to 10 per cent of the piece-goods imports in the same period (see Figure 124).

Cotton Trade with China

The future expansion of Japan's cotton goods export trade, however, is not unclouded. In China, it is confronted with two possibly serious though indeterminate obstacles. They are the anti-Japanese boycotts and the development of a cotton mill industry in China. The anti-Japanese boycotts, which have occurred with great frequency since 1919 and are discussed at length in the next chapter, have seriously disturbed the trade in cotton textiles and have reacted to the detriment of the Japanese industry. The fundamental causes of these boycotts have not been removed and there is no guarantee that they will not recur on the anniversary of each "Humiliation Day" of the future. The possible permanent effect of the boycotts cannot be estimated, but it has been a part of each boycott campaign not only to discourage the purchase of Japanese wares, but to encourage the development of Chinese mills to replace permanently the Japanese goods in the Chinese markets. The Chinese cotton mill industry has shown a decided tendency to growth since 1919, and the number of spindles has increased two and one-half times. The increase cannot be traced entirely to the boycotts, for the Japanese themselves have taken an active part in this development. In 1915, Japanese capital owned and controlled about 16 per cent of the cotton spindles in China;[1] in 1928, 38 per cent were Japanese owned (see Table LI). Of China's 3,638,000 spindles, 1,397,000 were in Japanese mills. These mills were established in China presumably for the advantages to be had from cheaper labor and the nearness both to the source of the raw material and to the consuming market. If these be advantages over the exporting mills in Japan, they hold equally for all mills in China. Japanese mills in China are as much a menace to the cotton industry in Japan as Chinese or British mills in China. China now has a cotton mill industry with over 55 per cent of the spindle capacity of Japan.

TABLE LI.—COTTON SPINDLES AND LOOMS IN CHINA, 1928[1]

	Number of mills	Number of spindles	Number of looms
Chinese owned	74	2,087,506	13,907
Japanese owned	43	1,397,272	13,981
British owned	3	153,320	1,900
Total	120	3,638,098	29,788

[1] Data from Foreign Trade of China, *op. cit.*, 1928.

The Chinese industry can be expected to continue to grow under the stimulus of the enormous home market, and the growth of the home industry will reduce the import demand. It has already gone a long way toward eliminating cotton yarns from the import trade. In 1915, 358,000,000 pounds of yarn were imported into China, and in 1928, the import demand was under 38,000,000 pounds. The mills in China are now producing most of the yarns required for home consumption (see Figure 125). The same development can be expected in piece-goods as the mill production of cloth increases. Japan's fate in the China market may very probably be similar to the fate meted out to Great Britain in the Japanese trade. In 1876 to 1880, Great Britain supplied Japan with 54 per cent of all of her imports. In 1924 to 1927, her share was less than 10 per cent (see Figure 126). Cotton textiles, which were chiefly from Great Britain, constituted one-third of the Japanese import trade in the early years of industrialization. As the Japanese cotton mill industry developed, first the yarns and then the tissues were dropped from the import trade and were replaced by larger and larger quantities of raw cotton for

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[1] Great Britain, Committee on Industry and Trade, Survey of Textile Industries, p. 107.

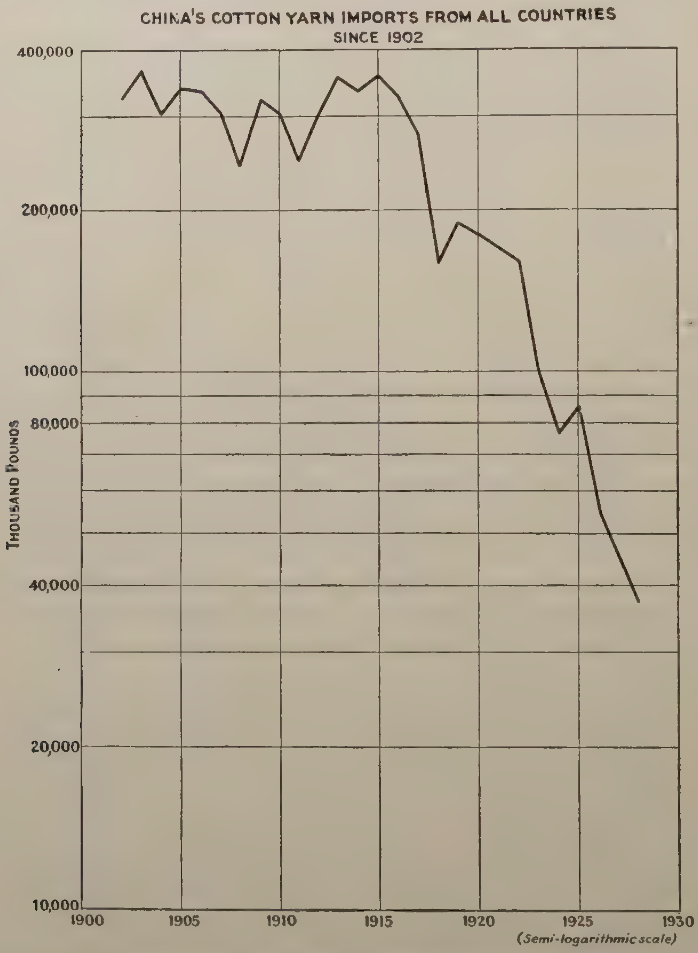

FIG. 125.—China is becoming self-sufficient in the manufacture of yarns, and imports are declining rapidly.[1]

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[1] Data from Foreign Trade of China, *op. cit.*

the home industry (see Figure 127). The demand for cotton textiles was supplied by the home industry and Great Britain was gradually pushed out of the Japanese trade.

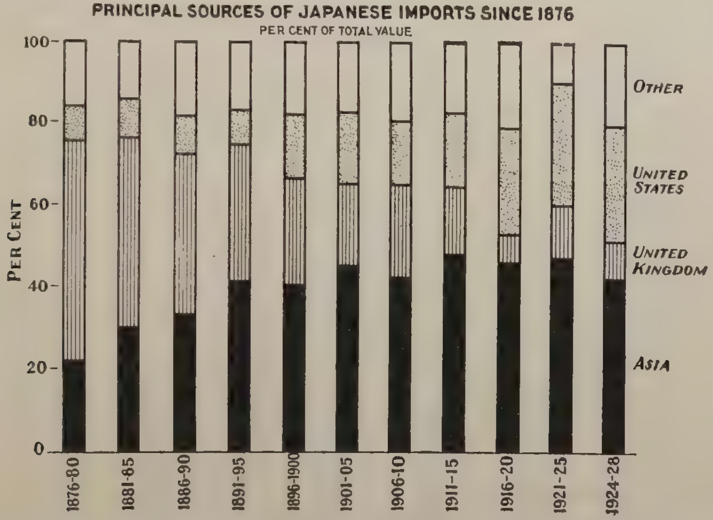

FIG. 126.—With the development of manufacturing in Japan, the United Kingdom has been squeezed out of the Japanese import trade by the United States and Asia as suppliers of raw materials.[1]

Obstacles to Japanese Cotton Trade with India

In India, the expansion of the Japanese cotton goods trade has met with opposition both from British and from Indian sources. There has been a great deal of agitation against the so-called "unfair competition" in cotton textiles from Japan, and in 1927, the Indian Tariff Board recommended for Indian cotton yarn a protective tariff which was directed in the main against the Japanese product. In a summary of its conclusions the Indian Tariff Board stated that:

> Conditions of labor in Japan are inferior to those in India in respect of hours and the employment of women and juveniles at night.
>
> It must, therefore, be held that there is unfair competition between Japan and India, and that this competition is an important cause of the present depression in the cotton textile industry.[2]

It is the general belief in India that labor conditions in Japan are decidedly inferior to conditions in India, but it must be stated here, in all fairness to Japan, that this belief is not well-founded. In the legal hours of labor and in the employment of women and young persons at night, through the double shift of labor, India's conditions

[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] Report of the Indian Tariff Board, Cotton Textile Industry Enquiry, 1927, Vol. 1, p. 207.

are better, but in wages and in the actual hours of labor practiced in the spinning mills and in many other ways, the inferiority of Japanese conditions is altogether questionable. Before the abolition of midnight labor in Japan, the working day for the operatives in the spinning mills was 10 hours of labor, whether it was day or night. In India, it was also 10 hours. The 60-hour week for labor was the practice in both countries. So far as the workers were concerned, therefore, the hours of labor in the two countries were the same in cotton spinning.

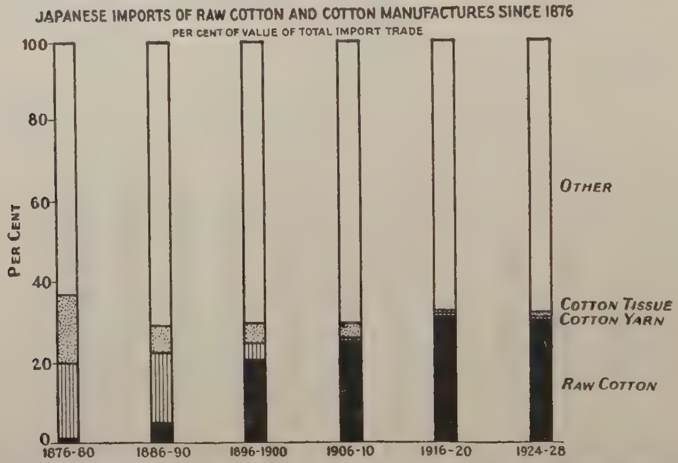

FIG. 127.—Cotton manufactures have been practically eliminated from the import trade, while raw cotton has become of greater and greater importance.[1]

The predominance of female labor in the Japanese mills has also led the Indians to believe that the Japanese labor is cheaper than the Indian because female labor is generally cheaper than male. But, as a matter of fact, the wages of female labor in the spinning mills of Japan are actually higher than the wages of male labor in the Indian spinning mills. The girl spinner in Japan earned in 1926 from 50 to 60 or 65 cents a day of 10 hours' labor. In the Bombay mills personally investigated by the author a few months after he had left Japan, the wages of male spinners averaged from 34 to 43 cents a day of 10 hours. The wage level of the Bombay mills is the highest in India. In other parts of the country, male spinners were receiving as low as 18 or 21 cents a day and rarely received more than 36 cents, or one rupee. It is not so much the inferior conditions of labor in Japan as the superior efficiency of the Japanese workers that has given Japan the advantage over India in her own market.

The girl spinner in Japan will tend from 300 to 400 and sometimes even 600 spindles. Male spinners in Bombay were tending 140, 150 or

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[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

175 spindles. In one mill in Calcutta, there were spinners tending as many as 360 spindles, but other spinners in the same mill were operating 180 spindles only. In other mills and other cities, the number of spindles operated by one spinner was often as low as 100, but the usual task of the male spinner in India is 150 or 175 spindles. The Japanese girl spinner is on the average from two to three times as efficient as the Indian male spinner. The secret of Japan's success in the Indian trade undoubtedly lies in that fact. In order to determine the possible effect of the greater output of the Japanese worker, an estimate of the spinner's wage per pound of yarn is here presented, based on a personal investigation of spinning mills in both countries. The data are not absolutely comparable because Japanese mills use relatively much more American long staple cotton than the Indian mills, and there are other technical differences. But comparing as nearly as possible the same product, the spinner's wage per pound of yarn in India, in spite of lower wage rates, ranged in the mills investigated from 23 to 86 per cent higher than the Japanese cost. This is because the output of the Indian worker is much lower than the output of the Japanese. The difference in efficiency is similar to the difference between the Japanese and American workers. It does much to counteract the cheaper wage.

In the weaving of cloth, the differences in wage rates and in efficiency of labor in Japan and in India are not so marked. The Japanese weaving mills are generally not operated in the double shift of day and night labor, but the working day is often more than 10 hours. Wages for weavers in Japan average from 50 to 70 cents a day. Weavers in Bombay average 63 to 73 cents a day, but in other parts of India their wages are more likely to be 36, 49, 56, or 61 cents a day, which is not very different from the Japanese wage. The difference in efficiency is also much less. In the larger Japanese mills, a weaver will operate four of the ordinary non-automatic looms, but there are many small mills in Japan where the ratio is two looms per weaver. In India, the usual practice is two looms to the weaver, but in the few mills where the automatic loom is in use, the ratio is three or four looms per weaver. The Japanese weavers operate many more of the automatic looms.

The weaver in Japan who operates four looms at 60 cents a day produces at about 20 per cent less cost per pound of cloth than the weaver in India who operates two looms at 73 cents a day. The difference would be greater where the Indian wage is lower. Because the Japanese weaving industry is not standardized and operates on hand looms as well as on the latest automatic devices, it is difficult to determine what advantage, if any, the Japanese have in the production of cloth, but in the spinning of yarn there can be no doubt that the greater

Japanese efficiency has created a margin of advantage that has made it possible, in the past, for Japan to buy raw cotton in India, transport it to Japan, manufacture it into cloth or yarn, return it to India, meet the import tariff, and place it on the market at a price to compete with the Indian product.

In respect to the advantage of the double shift in the Japanese spinning mills, the Indian Tariff Board stated that the "double shift working in Japan gives the Japanese industry an advantage of 4 per cent on the actual cost of manufacture both of yarn and cloth. This advantage is considerably increased if a reasonable return on capital is included in costs of production."[1] This finding of the Board is open to question. It is based on the theoretical costs of double shift operation in Indian mills, not on Japanese practice, and does not take into consideration the extra burden of the dormitory system and its attendant costs which the double shift operation imposes upon the Japanese mills. It also fails to allow for the extra cost of lighting the mills at night. It is probable, therefore, that the advantage of the double shift system is considerably less than the Tariff Board estimate has it and that any advantage in the cost of production that the Japanese mills may have is due more to the greater efficiency of the Japanese workers than to the double shift operations. A difference of even 23 per cent, the lower estimate of the spinner's wage cost per pound of yarn, would work out in the ultimate cost of production as a much more important factor than the double shift operation.

The recommendations of the Tariff Board resulted in an amendment of the Indian tariff, which places a minimum specific duty on cotton yarns in case the ad valorem rate of 5 per cent does not amount to 1½ annas (3 cents, gold) per pound. This specific duty, though applied to all yarns, is effective, in particular, against the cheaper Japanese product.[2] The significance of the tariff lies in the spirit of opposition to the Japanese trade which was manifested to secure the amendment. The same spirit continued the agitation for more adequate protection of cotton cloth against Japanese competition and succeeded in advancing the rate on cotton cloth very considerably in the cotton tariff bill that passed the Indian Legislature on March 31, 1930. This act raises the import tariff on cotton piece-goods from 11 per cent to the general tariff rate of 15 per cent for revenue, and places an additional protective duty of 5 per cent with a minimum of 3½ annas (7 cents, gold) a pound on plain gray cotton piece-goods coming from countries other than the United Kingdom. This protective duty is to be enforced for three years only, but it is a direct blow at the Japanese trade, for Japan is the only other important source of cotton piece-goods imports for India. Japanese exporters and industrialists claim the new tariff will wipe out nearly half of Japan's staple export in this class of goods.

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[1] Cotton Textile Industry Enquiry, *op. cit.*

[2] India, Act No. XXIII of 1927, An Act further to amend the Indian Tariff Act, 1894, in order to protect the manufacture of cotton yarn in British India; and Cotton Textile Industry Enquiry, 1927, *op. cit.*, Vol. 1.

Before the imposition of the new tariff, Japan supplied 14 per cent of the Indian demand for cotton manufactures,[1] but it is questionable how long she can retain this trade under the new imperial preference. Great Britain is the chief source of India's cotton textile imports and she is not anxious to lose this important market. Opposition to the Japanese trade comes not only from the mills in India but also from the British exporters. The international wrangling over the use of women and children at night in the Japanese mills and the pressure that was finally exerted upon Japan to abolish midnight labor in the mills had its origin for the most part in these competitor countries. Although the Japan-Indian cotton goods trade has increased remark-

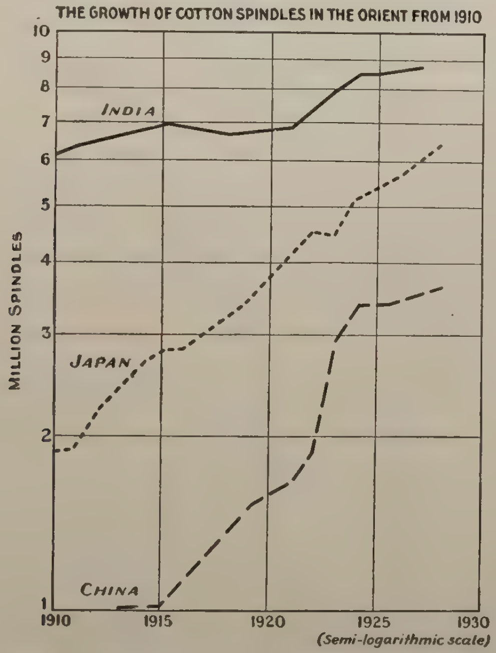

FIG. 128.—India and China are developing spinning industries that will curtail seriously the markets for Japanese cotton goods.[2]

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[1] Estimated from trade data published in Statistical Abstract for British India, *op. cit.*, and the Bombay Millowners' Report, *op. cit.*

[2] Data from *Chinese Economic Bulletin*, *op. cit.*, No. 20, May 18, 1929; Bombay Millowners' Report, *op. cit.*, 1927; Japan, Statistical Report of Department of Agriculture and Commerce, *op. cit.*, 1905–1915; Economic Statistics of Japan, *op. cit.*, 1925–1927; Mitsubishi *Monthly Circular*, *op. cit.*, August, 1929.

ably, Great Britain still supplies over 83 per cent of the Indian piece-goods imports[1] and, because of her political control, will not be ousted as readily from that trade as she was from the China market. The outlook for Japan in India is not particularly promising.

The Indian domestic cotton mill industry is already of considerable size. As a matter of fact, India has 2,330,000 more spindles than Japan. The Japanese production of yarn is greater because the Indian mills as a rule do not work at night. For the manufacture of piece-goods, India has about twice as many power looms in large factories as Japan, and there is about twice the mill production.[2] The Indian mill industry is growing and absorbing more and more of the home market, while the import demand has shown no disposition to increase above the 1913 level. India, like China, produces her own raw material, has much cheaper labor than Japan and has an enormous home market. Both China and India still have a very large import demand for cotton textiles unsupplied by the home industries, but the growth of their domestic industries does threaten the future expansion of Japanese exports (see Figure 128).

Possible Markets for Expansion of Japanese Cotton Trade

The most promising field for the expansion of the Japanese cotton goods export trade is in the unindustrialized markets of the world. The possibility of entering the more fully industrialized markets is very small, for if there are any imports, the demand is usually for the finer grade of goods of the older industrial nations and the advantage is with the nations of similar culture. Since the World War, a wave of commercial nationalism has spread over the world, and every petty nation seems determined to develop a textile industry of its own, protected if necessary by high tariff barriers. The cotton textile industry has become the battle front of international commerce.

In the Dutch East Indies, Malaya,[3] the Philippines, and the rest of Asia outside of China and India, there is no prospect at present of the growth of a domestic industry. In those markets, Japan has only to compete with the other exporting nations. In the Dutch East Indies, the United Kingdom and Holland are the chief competitors, but the Japanese trade in piece-goods has increased from $191,000 to $16,000,-

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[1] Estimated from Accounts Relating to the Seaborne Trade and Navigation of British India, *op. cit:*

[2] Bombay Millowners' Report, *op. cit.*, 1927, and statements issued by the Japan Cotton Spinners' Association for 1927.

[3] The term "Malaya" as used here refers to British Malaya which includes the Straits Settlements (Singapore, Penang, Malacca, Labuan, Dindings, and Christmas and Cocos Islands), the Federated Malay States, and the Protected Malay States.

000 in 15 years, and now constitutes between one-fourth and one-fifth of the import demand. In British Malaya, the United Kingdom controls the bulk of the trade, but Japan in recent years has supplied as high as 15 per cent of the piece-goods imports. In the Philippines, the Japanese piece-goods trade has also amounted to about 15 per cent of the import demand. The other countries of Asia are not markets of any size or importance and Japanese trade with them is small (see Table LII).

TABLE LII.—THE COTTON PIECE-GOODS MARKET IN ASIA[1]

(Five-year average, 1923 to 1927)

Importing country	Value of imports in thousand dollars, gold		Japan's share, percentage of total
	Total imports of piece-goods	Piece-goods imports from Japan	
British India	213,900	23,200	10.8
China	119,340	72,750	61.0
Dutch East Indies	68,200	14,000	20.6
British Malaya	23,550	3,558	15.1
Philippines	18,127	2,693	14.8
Indo-China	8,950	61	0.6
Siam	8,750	1,210	13.8
Total	460,817	117,472	25.5

[1] Taken from the official trade returns of each country. Data for British Malaya for the years 1925 to 1927; for Siam, 1926 to 1927; for Indo-China, 1927; for the rest, 1923 to 1927.

Outside of Asia, Japan has no special advantage in the cotton textile trade. The remaining 20 per cent of her cotton textile exports go to a variety of markets in which the Japanese goods are of relatively small importance. The most promising of these markets for future expansion is Africa. It is unindustrialized and consumes a large amount of cotton goods, and in recent years has taken increasing quantities of Japanese piece-goods. This trade developed as a direct outgrowth of the anti-Japanese boycotts in China and southeast Asia, which stimulated Japanese exporters to seek other outlets for the goods that were rejected in the Chinese markets. Great Britain is the chief competitor in this trade, but Japan now supplies about one-fifth of the import demand for cotton piece-goods.[1] The trade in recent years has grown to nearly 3 per cent of the Japanese cotton textile exports.

In Australia, New Zealand and Canada, the Japanese trade in cotton piece-goods is negligible. The exports to Australia amount to 14 or 15 per cent of Japan's total cotton goods export, but they are insignificant in the Australian import demand, 90 per cent of which is supplied by the United Kingdom and only 5 per cent by Japan. In the other markets, the Japanese cotton piece-goods trade is even less important. In all of these markets, Great Britain, under imperial preferential tariffs, supplies the bulk of the import trade. In Europe and in the United States, the Japanese cotton goods trade has no important outlet, for the countries have cotton goods industries of their own, protected in many cases by tariff barriers. What demand there is for imports is in the finer grades of the product which are not produced in any quantity in Japan. The countries of South America should offer a field for Japanese cotton goods, but there is no significant export to those countries at present, and Brazil, a country with which Japan is endeavoring to foster trade relations, now manufactures nearly seven-eighths of its consumption of cotton textiles.[1]

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[1] Estimated from trade data in U. S. Commerce Yearbook, Vol. 2, *op. cit.*, 1928.

It is impossible to forecast the future of the Japanese export trade in cotton textiles. There are large unindustrialized markets in southeast Asia, in Africa, and in South America; there are large markets in India and in China; there is considerable import demand in many other quarters. The possibility of Japan securing a larger and larger share of this international trade depends upon many things. It cannot be achieved merely on the basis of cheap labor and low price. Quality and style, marketing facilities, political alliances and tariffs are also determinants. It is not to be supposed that Japan will be unopposed by competing nations. Her cheap labor is at best a temporary asset. It is probable that international regulations will tend to equalize hours and conditions of labor. If there is no regulation, success would probably go to the nation with the lowest standard of living, and both China and India have lower standards than Japan. In the meantime, the advantage of her cheap labor is open to question. While Japan has taken a great deal of the British trade since the World War, as is shown in Figure 124, her success cannot be explained entirely by cheap labor. There have been a great many other factors influencing this shift in trade, not the least of which are internal conditions in the British industry itself. An analysis of the labor costs in Japanese cotton mills, which has been given in Chapter XX, indicates that there is in fact a very small margin of advantage for Japan from her cheap labor. The many additional payments to labor that supplement the cheap wage and the large numbers of workers, in comparison with western standards, required to operate the mills, wipe out much of the advantage of the cheap individual wage. Actual labor costs in Japan and the United States are not far apart in spite of the enormous differences in wage rates. The United States has not been ousted from the South

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[1] *Op. cit.*

American trade and, similarly, Great Britain still supplies a very large part of the Chinese and Indian import demands for cotton piece-goods.

OTHER EXPORT INDUSTRIES

Raw silk, cotton textiles, and silk tissues make up over 70 per cent of Japan's export trade. The commodities of the remaining 30 per cent are supplied by a great many different industries, none of which has developed to any considerable size. The export of clothing and clothing accessories is the most important, but this classification includes a miscellany of small items, the largest of which is cotton knit goods amounting to a little over 1 per cent of the total. The knitting industry requires little skill. It can be set up in small establishments without any great expenditure of capital or knowledge of machinery. Parts of India that are remote from factories and modern machinery have numerous knitting machines in the small shops of the native bazaars. Any extensive expansion of this trade is limited by these factors, for the chief market for Japanese knit goods is British India. The rest of the trade is very scattered. The only other important item included under the clothing and clothing accessories classification is shell buttons, the product of a minor industry that is not likely in itself to become important in the nation's foreign commerce.

Of the other export industries of Japan that are at all significant in the foreign trade, those for which the nation would appear to have adequate resources for considerable expansion include pottery and glassware, aquatic products, and tea. The pottery export trade has shown a healthy growth, but it is still small, amounting to about 2 per cent of the total value of exports. The most of the present trade goes to the United States and Asia. Further extension depends upon the Japanese producers' skill in being able to meet the tastes and fashions of the market and in creating a demand for their own designs and products. Japan now supplies about one-fourth of the American import of pottery and one-half the Asiatic import demand.

The export of aquatic products goes practically all to China. It amounts to 1 per cent of the export trade. The possibility of extending this trade on a large scale into other markets is limited by differences in food habits which are a serious obstacle to international trade in food products. The same barrier limits the progress of the tea trade. The export of Japan tea has failed to make any headway since 1900, and in recent years there has been a heavy decline in the amounts exported. America is almost the only customer for Japan tea. Important tea consuming nations like Russia and the United Kingdom prefer other teas. Tea is less than 1 per cent of the export trade.

The copper trade, important in the early days of foreign commerce, is no longer significant. Copper exports amount to less than one-tenth of 1 per cent of the total exports, and Japan has become an importer of copper instead of an exporter. The coal trade, too, is unimportant. Coal exports amount to nearly 1.5 per cent of the export trade, but imports of coal practically balance the exports. Coal and copper are raw materials which, if available, should be utilized within the country, not exported. They cannot be regarded seriously as export commodities.

The match trade was once important in Japan's foreign commerce. From 1891 to 1905, it averaged over 3 per cent of the exports and though its relative importance declined due to the expansion of trade in other fields, exports of matches continued to grow in value through 1919 when they amounted to over $16,000,000. But 1919 was the peak of the trade and since then a rather rapid decline has set in. In the years 1924 to 1927, exports have averaged annually less than $3,500,000 or about three-tenths of 1 per cent of the present export trade. Much of the loss of this trade was due to the poor and uneven quality of the product. It is doubtful if the markets can be regained in the future, both because the chief importing countries, China and India, have established match industries of their own and also because of the monopolistic activities of the great Swedish match trust.

The remaining exports of individual significance are paper and sugar. Paper and paper manufactures amount to 1 per cent of the export trade. There may be some opportunity for expanding the paper manufacturing industry for both the foreign and domestic markets, since imports of paper and paper manufactures exceed the exports in value. The paper industry now depends upon foreign sources for about 14 per cent of the wood-pulp requirements.[1] If the industry is expanded to take care of a greater share of the home consumption and to produce a larger surplus for export, it will be necessary to increase the imports of the raw material. Japanese sugar is made very largely from imported raw sugar, and China is almost the only customer. The trade amounts to less than 2 per cent of the total export trade and has been severely disturbed by the boycott activities of the Chinese. It needs a more diversified market for expansion and development.

There remain to be considered in the present export trade of Japan the products of many small industries—straw braids, matting, lamps, lacquer ware, umbrellas, tooth brushes, iron manufactures, and a great miscellany of fabricated wares that are not in themselves important but that do have an importance in the economic life of the nation and offer perhaps a better field for expansion than those industries that are already well established and have a fair share of the international trade. It is probable, due to the nature of Japanese industry and the possibility of using farm labor on subsidiary work with the aid of small motors, that these industries might be expanded to increase the exports of the nation. Their products now constitute about 2 per cent of the exports. A larger share of the export trade derived from these industries would be a healthy development in Japan's foreign commerce though it would stimulate the domestic or household industries rather than the western factory industries. In this chapter, the possibilities and the shortcomings of Japan's export industries have been examined. In the chapter that is to follow, consideration will be given to the markets for Japanese goods and the problems that Japan must face in those foreign markets.

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[1] Five-year average, 1922 to 1926, computed from data in Mitsubishi *Monthly Circular*, *op. cit.*, October, 1927.

CHAPTER XXIV

ANALYSIS OF MARKETS FOR JAPANESE EXPORTS

JAPAN'S export trade moves in two streams: her luxury product, raw silk, goes toward the east to the United States; her staple manufactures, chiefly cotton textiles, go toward the west and the south to the other countries of Asia. The trade with the rest of the world is of minor importance, for the United States takes 42 per cent of the exports and the Asia market 43 per cent (see Figure 129).

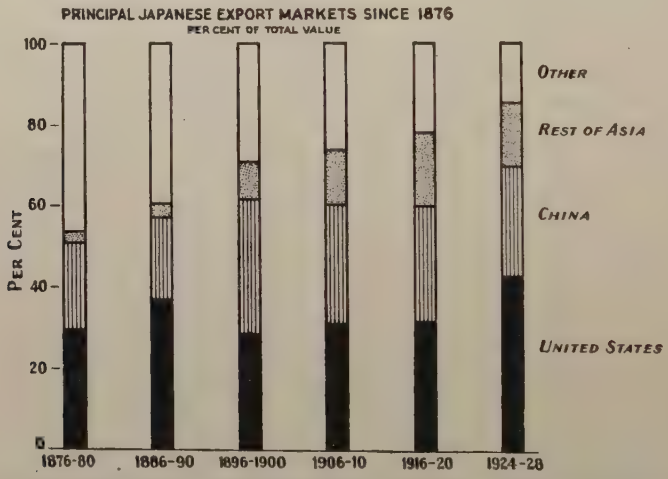

FIG. 129.—Japan's export trade flows in two major streams, one to the United States, the other to Asia.[1]

THE AMERICAN MARKET

Raw silk is the only item of importance in the trade with the United States, and in recent years it has constituted nearly 85 per cent of the total. No other product is of any real significance in this trade (see Table LIII). The exports of silk tissues, pottery, and tea to the United States are important to those industries in Japan, for the American market takes over 80 per cent of the tea export, about 30 per cent of the pottery and glass, and 14 to 17 per cent of the silk tissues; but these products are of little importance in the commerce of the two nations, for they constitute less than 6 per cent of the Japanese exports to the United States.

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[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

TABLE LIII.—IMPORTANT JAPANESE EXPORTS TO THE UNITED STATES[1]
(Four-year average, 1924 to 1927)

Goods	Value in thousand dollars, gold	Percentage of total
Raw silk	363,842	84.5
Silk tissues	11,140	2.6
Silk handkerchiefs	1,021	0.2
Pottery and glass	6,874	1.6
Tea	5,250	1.2
Others	42,606	9.9
Grand total	430,773	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927.

The trend of the trade with America will be determined by the future of raw silk and, as the previous chapter has emphasized, it is a future threatened both by artificial silk and by the possible development of a raw silk industry in China. In view of the industrial character of the United States, there seems to be little likelihood of the development there of any extensive market for other Japanese commodities.

THE ASIA MARKET

The other stream of trade which flows to Asia, depends very largely upon China and the Chinese. Nearly two-thirds of this trade is with China, Hong Kong, and Kwantung Leased Territory, and a very large share of the remainder, barring British India which takes nearly half of that remainder, is with the Chinese merchants in other parts of Asia (see Table LIV). Figure 130 shows the increasing importance of China and the rest of Asia in Japanese trade. The importance of Asia as a market for Japanese manufactures appears even more striking if raw silk, which goes almost entirely to America, is excluded from the exports. Asia then takes 68 per cent of the exports, and China's share is 43 per cent. The cotton textile industry of Japan is almost completely dependent upon China and the rest of Asia for its export market. Nearly 90 per cent of the cotton goods exports go to Asia, and 52 per cent to China, Hong Kong, and Kwantung. The China market is essential to the development of Japanese export trade.

TABLE LIV.—JAPAN'S EXPORT MARKETS[1]
(Five-year average, 1925 to 1929)

Markets	Value of exports in thousand dollars, gold	Percentage of total Japanese exports
China, Hong Kong, and Kwantung	278,186	26.6
British India	84,101	8.0
Rest of Asia	87,580	8.3
Asia total	449,867	42.9
United States	444,118	42.5
Europe	73,751	7.1
Australia and New Zealand	28,976	2.8
Others	49,609	4.7
Grand total	1,046,321	100.0

[1] Computed from data in Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927, and Mitsubishi *Monthly Circular*, *op. cit.*, February, 1930.

The Japanese and their leaders are aware of this dependence upon the China trade. Baron Makino, when he was Minister of Agriculture and Commerce for Japan, frankly admitted the prime importance of China to Japanese commerce in the following statement which though it was made in 1915 is still apt in 1930:

> China has people, and population is what makes trade. No other country in the world offers so vast a field for trade. With the growth of education and the development of material progress, possibilities of commercial enterprise in China are simply unlimited. The anxiety of the powers to enter into more and more intimate commercial and political relations with China cannot but excite intense interest in Japan; for China is our nearest neighbor, our best customer; and our commercial and political relations with that country are superior to those of any other nation. It is therefore a matter of infinite importance what course China takes in dealing with the numerous applicants for her patronage at this or any other time.
>
> It is true that Japan enjoys a profitable trade with many countries of the West. Our exports to America are of increasing volume and value, while the various nations of Europe welcome what we can supply. But this Occidental trade at its best is difficult for us to handle with any satisfactory degree of achievement, for it is always more difficult to deal with highly developed commercial nations than with those less advanced in modern progress. Trade with peoples of lower social standards is always more easy and profitable. There was a time when Japan hoped to find her chief field of commercial enterprise in the West; but today the mind of Japan is all toward China as the commercial hope of our future, not to say anything of our geographical and racial advantages with that country.

> It is our ambition to be to the East what Great Britain is to the West. We have left no means untried in making a thorough investigation of the present conditions in China, so as to arrive at as accurate an estimate as possible of what is to be expected in the commercial relations of that country with Japan in the near future . . . Now is the time to explore China commercially, and any demand we create now for useful articles will in all likelihood become permanent. It is not too much to say that a great part of our hope for future financial rehabilitation in Japan depends upon how we can further develop trade with China. In this matter we cannot afford to be beaten by our foreign competitors, for the very welfare of the nation depends upon it. I would have all Japanese regard it as the foundation of our national prosperity. Should we lose China as a customer it would mean the ruin of our commercial prospects.[1]

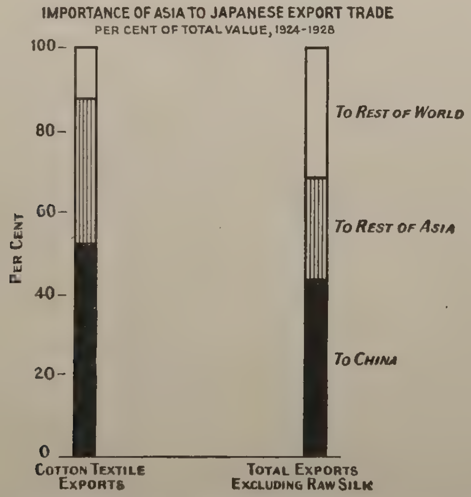

FIG. 130.—China and the rest of Asia take the greater part of Japan's export of cotton textiles, and the Asia market dominates the total export trade other than raw silk.[2]

But Japan's conflicting interests in China have jeopardized the smooth progress of any such policy as that annunciated by Baron Makino, and the future of the Japan-China trade is uncertain. Japan insists that a strong power occupying portions of the adjacent mainland would be to her a military menace. As a result, she has annexed Korea and established a sphere of influence in Manchuria. She covets Chinese resources, and she has aroused Chinese antagonisms by her aggressive industrial and mining activities as well as by her political

[1] U. S. Bureau of Foreign and Domestic Commerce, Cotton Goods in China, *op. cit.*, pp. 108–109.

[2] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

penetration in China. Her industrial future, as the Minister of Agriculture and Commerce pointed out, depends upon her foreign trade, and she must have access to the Chinese markets in order to maintain and increase that trade. The first two motives, political and economic aggression, which are necessarily encroachments upon Chinese political sovereignty, are completely incompatible with the third, trade, which presupposes the maintenance of friendly relations with China. The more successful Japan is in securing control of Chinese territory and resources, the weaker becomes her hold upon Chinese trade. With each overt act of aggression on the part of the Japanese since the episode of the *Tatsu Maru* in 1908, but more especially since the Twenty-one Demands on China in 1915, the Japanese export trade to China has been disrupted and profoundly disturbed by anti-Japanese boycotts.[1]

TABLE LV.—IMPORTANT JAPANESE EXPORTS TO THE CHINESE MARKET[1]

(Four-year average, 1924 to 1927)

Goods	Value in thousand dollars, gold	Percentage of total
Cotton tissues	86,519	31.4
Cotton yarns	23,637	8.6
Sugar	15,132	5.5
Coal	11,096	4.0
Aquatic products	8,857	3.2
Paper	7,454	2.7
Total	152,695	55.4
Grand total	276,268	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927. The "Chinese Market" includes China, Hong Kong and Kwantung Leased Territory.

THE ANTI-JAPANESE BOYCOTTS IN CHINA

Boycotts on Japanese goods have occurred in at least 7 of the 10 years since 1919. Some of the boycotts lasted for very long periods extending throughout one year and into the next; others were over in two or three months. Some were more effective than others, but they all left some impression upon the trade. It is extremely difficult to measure the effect of the boycotts, since so many other factors—fluctuations in exchange, the price of silver, famines and wars—enter into the trade relations of the two nations and influence the trend. To assign to each factor its proper weight is difficult, and it is especially difficult to gage the influence of a psychological mass movement such as the boycott.

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[1] The story of the anti-Japanese boycotts in China has been assembled from current reports in *The North China Herald*, Shanghai; *The Japan Chronicle*, Kobe; *The Trans-Pacific*, Tokyo; *The Far Eastern Review*, Shanghai; and miscellaneous publications in English published in China.

The Tatsu Maru Episode

The first anti-Japanese boycott occurred in 1908 when the Japanese steamer *Tatsu Maru* bound for Macao, a Portuguese colony on the China coast, was seized by Chinese officials on the charge of attempting to smuggle arms and ammunition into the hands of Chinese revolutionists. There was no mistake about the cargo and apparently none about the intent, but the Japanese government claimed that the steamer had been overhauled in Portuguese, not Chinese waters. As a result, Tokyo forced Peking to apologize, to pay an indemnity, to salute the Japanese flag when it was rehoisted over the *Tatsu Maru*, and to punish the Chinese customs officials who captured the vessel.

South China, where the arms had been seized, resented the affair especially, and the commercial interests and guilds of that section got together and declared a boycott on all Japanese products until the damage inflicted should amount to $10,000 for every dollar of indemnity that Japan had exacted. The boycott soon spread and was endorsed by Peking, Hankow, Shanghai, and other large cities, and by the Chinese in Singapore, the South Sea Islands, Australia, and San Francisco. The goal of $10,000 for every dollar of indemnity was not attained, but Japanese exports to China declined in the nine months from April through December, 1908, by more than $10,000,000 (U. S. currency) in comparison with the same period of 1907, an amount equivalent to more than 31 per cent of the 1907 trade during those months. If the trade of Hong Kong and Kwantung is included, the decline in trade for the same months amounted to $13,300,000 (U. S. currency) or more than 7 per cent of the total Japanese export trade in 1908. There were undoubtedly other factors influencing this decline in trade, for the total imports of China from all countries declined by 2 per cent in 1908, but the decline in imports from Japan was relatively four and one-half times as great as from the other countries of the world.[1] The boycott was sufficiently effective against Japanese goods to induce the Japanese Spinners' Association, in May, 1908, to place a bounty of 75 sen (about 37.5 cents, U. S. currency) per bale,[1] an amount equal to about 0.3 per cent of the value, on cotton yarn exported to non-Chinese countries in order to encourage the development of other markets and thus free themselves from dependence on China.

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[1] Throughout the discussion of the Japan-China trade, it has been necessary to refer to both the Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, and the Foreign Trade of China *op. cit*. The two records are not comparable and must be considered quite separately. The Chinese trade returns do not include Hong Kong or Kwantung Leased Territory. The Japanese returns list China, Hong Kong, and Kwantung separately. Where the trade of Hong Kong and Kwantung has been included with China, it has been specially noted or is spoken of as the "China market."

The Boycott of 1909

The second anti-Japanese boycott occurred in September and October of 1909 as a protest against Japanese aggression in Manchuria. The immediate cause was Japan's insistence upon China's agreement to the extension of the Kirin-Horyeng Railway and the reconstruction of the Antung-Mukden Railway. Peking's capitulation to Japan's demands was bitterly opposed by the Chinese not only in Kirin and Antung, but also in Peking, Shanghai, Hong Kong, Tientsin, and other parts of China. The agreements were made, however, and the agitation died down in the face of the inevitable. This was one of the boycotts of very short duration, and it had little or no effect upon the monthly trade returns of Japan, probably because its impetus was spent in boycotting Japanese paper money and Japanese goods on hand. Students reverted to the use of flint and tinder rather than purchase Japanese matches. They destroyed Japanese goods and attacked shops that had Japanese goods for sale, but the agitation did not last long enough to affect new orders of goods and, therefore, the monthly trade returns to any appreciable extent.

The Boycott against the Twenty-one Demands

In 1915, the Japanese made their famous Twenty-one Demands upon China which resulted almost immediately in a boycott of Japanese goods by the Chinese people and which was followed by a series of subsequent anti-Japanese boycotts that have disrupted Sino-Japanese trade relations very seriously from that day to this. The 1915 boycott was effective for only the six months from January to June, but in that period the volume of exports from Japan to China, Hong Kong and Kwantung, compared with the first half of 1914, decreased by $17,900,000 (gold), or 29 per cent. To China alone, the trade decreased by 33 per cent in the six months period. By July, there were official mandates from Peking, under pressure from Japan, against the boycotting of Japanese goods, but more effective in bringing this boycott to an end was the shortage of European goods due to the World War. The European merchants who had hitherto supplied China with all manner of goods were unable for war reasons to send supplies to the

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[1] *North China Herald, op. cit.*, p. 518, May 30, 1908.

Asiatic market, and Japan became suddenly the only source of a great many manufactured articles. For that reason, the trade in the second half of the year showed an increase over the same period in 1914 and did much to offset the effects of the boycott in the first half of the year. The net decrease in exports from Japan to the China market for the whole year compared with 1914 was about 12 per cent. In addition to anti-Japanese activities, the boycotters also engaged in a positive endeavor to encourage the use of Chinese made goods, and the 1915 boycott marks the beginning of the decline in the cotton yarn imports from Japan which have each year been replaced to a greater and greater extent by yarn spun in the mills in China (see Figure 132 *b*).

Although China was forced by the circumstances of the World War to buy a large part of her import demand from Japan in the years that followed, the humiliation and resentment of the Twenty-one Demands continued to rankle, and in 1919 when the delegates to the Peace Conference at Versailles accepted Japan's claim on Shantung and incorporated it into the terms of the Peace Treaty, the Chinese again resorted to boycott activities to express their protest.

The Shantung Issue and the 1919 *Boycott*

The 1919 boycott began in May, before the Peace Treaty was signed, and had the immediate objective of preventing the Chinese delegates from signing the Treaty for China as well as expressing a protest to Japan. This boycott, as has been the case in many of the anti-Japanese boycotts, was at the same time both a patriotic movement against a foreign power and a disciplinary political demonstration against the home government. This mixture of purpose was evident in 1908, 1909, 1915, but especially in 1919. The people protested in this way not only against Japan's aggression but against the impotence or corruption of their own leaders. It became a great patriotic movement and was better organized and more effective than the previous boycotts.

The first evidence of the movement was in the almost general refusal to accept the bank notes issued by Japanese banks in China and the withdrawal of Chinese funds from those banks. From banking the boycott spread to all Japanese goods. It was taken up by the student class and student unions were organized in practically every college and university in the country. These unions became an active and important factor in spreading the boycott propaganda. They held demonstrations ten and twenty thousand strong. They drew up rules for themselves and the rest of the nation which they disseminated throughout the land pledging the people:

1. Not to do business with any Japanese.
2. Not to transport cargoes on any Japanese ship.
3. Not to accept or honor any Japanese bank notes.[1]

They did police duty for the movement, inspected shops and hawkers' wares, destroyed Japanese advertisements and traveled with messages from town to town when their correspondence and telegrams were censored by the authorities under pressure from Japan. They gave lectures and took up collections for the movement. They refused time and again to attend classes in demonstrations against the government. They held a straw hat war and confiscated the Japanese straw hats of pedestrians, kicked out the tops, and trampled them under foot. In Nanking, bulletin boards were decorated with straw hats, umbrellas, thermos flasks, and other Japanese goods that had been taken from the persons of pedestrians and destroyed by the students. For the most part, there was little rowdyism in the boycott. The student unions and the leaders of boycott associations stressed the importance of order and quiet. Large consignments of goods were confiscated and burned in quiet and orderly public demonstrations. In Hong Kong, a quantity of Japanese paper valued at $40,000 (Mexican) together with some porcelain, linen, cotton goods, and matches, for which no value was estimated, was burned in a single demonstration. In Yangchow, the students made a bonfire of $2,000 (Mexican) worth of Japanese goods that were landed on the wharf without any address in an attempt to smuggle them in. In Shanghai, they made bonfires of the so-called "low grade goods" or "inferior goods" of Japanese origin that were taken from shops found violating the boycott. In many other places, Japanese goods were burnt and destroyed in patriotic demonstrations.

The student activities had a highly political flavor antagonistic to the government in Peking and in the early part of 1919, the students were forbidden by Presidential mandate to meddle further in political affairs. They ignored the mandate, renewed their propaganda, and staged a huge demonstration of 3,000 students with banners, parading through the principal thoroughfares of the city. The police and gendarmes were indulgent, but the military authorities came and arrested several hundred. The rest of the nation was electrified by this action, for the hostility to the Japanese demands and to their acceptance by the Chinese delegates in Paris was by no means confined to the student unions. It reached into every village and hamlet of the country. Merchants' guilds, chambers of commerce, artisans and craftsmen, labor unions, and coolies joined in the boycott. The arrests brought the other classes actively into cooperation with the students and was the direct cause of the general strike of merchants, artisans, tradespeople, laborers, chauffeurs, and the entire Chinese population of Shanghai in June, 1919. The strike was an astounding spectacle lasting four days. The cause of the strike and its purpose are graphically presented in the telegram which was sent at the time to the authorities at Peking by the Shanghai merchants, a translation of which follows:[1]

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[1] *North China Herald*, *op. cit.*, May 17, 1919.

> To the President of the Republic and Cabinet Ministers:
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> On hearing of the arrest of 400 students in Peking, the Shanghai merchants have decided openly to join hands with the students and declare a strike from the 5th instant. In view of the seriousness of the situation, the undersigned organizations consider it a duty to lay before you the true position of the case in the most frank manner.
>
> While the diplomatic defeat at Paris is the immediate cause of the present unrest, the real fundamental cause is that the people have long been dissatisfied with the suicidal policy of those in power, who have recklessly bartered away our natural rights and rich resources for Japanese money to continue a meaningless, shameful, destructive civil strife, against the wish of the people. Tsao Ju-lin, Lu Tsung-yu and Chang Tsung-tsiang, these three persons are most closely connected with the negotiations of these ruinous loans. When the students at Peking made a demonstration against them, the whole nation responded in one voice of hearty approval. It was thought that, in view of the popular feeling against them, the government would let them go. To the disappointment of all, the authorities are determined to keep them, and their resignations were rejected in the warmest words. This started the students' strike at Peking, this has made the movement spread so rapidly throughout the country in such a short time, and this too has caused the merchants in Shanghai to declare a strike now. The situation is a very serious and painful one. Your Excellencies will have to choose either to dismiss the said officials to meet the wishes of the people, or to go against their will with unknown consequences in order to retain the services of these men. This we beg you to consider most carefully in the interest of the nation.
>
> *Signed,*
>
> Shanghai Chamber of Commerce
> Association of College Presidents
> Kiangsu Provincial Educational Assn.
> Shanghai Educational Assn.
> Chinese Y.M.C.A.
> Chinese Overseas Merchants Federation
> American Returned Student Club
> Chinese Christian Union
> National Peace Society
> World's Chinese Students Federation

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[1] As published in the *North China Herald, op. cit.*, June 14, 1919.

Political and Economic Effects of the 1919 *Boycott*

Following this action by the merchants of Shanghai, there were other protests from all over the country. As a consequence, the policy of the government was suddenly changed. The students who had been arrested were released and the resignations of the three designated officials were accepted. This was in June. In the early part of July, it became known that the Chinese delegates had declined to sign the Treaty of Peace. The immediate objectives of the boycott were won, and the movement thus far must be termed a complete success. The larger purpose of the boycott—the economic boycotting of Japan and the return of Shantung—could not be so quickly effected and this fact the leaders of the movement fully realized. It is said that a Japanese gentleman remarked to Dr. Sun Yat-sen in the latter part of 1919 that there were signs of the boycott weakening, but Sun Yat-sen replied, "We won't have really started the boycott for another two years."[1]

While Japanese goods on hand were burned and destroyed in large quantities, these demonstrations did not actually affect the Japanese trade. Orders of goods were canceled wherever possible and new orders were not placed with Japanese firms if the goods could be secured from other sources, but a great deal of trade continued to come in from Japan on long term orders that had already been placed. In fact, when the student unions were too insistent about the destruction of Japanese goods in stock, the chambers of commerce finally arranged a compromise permitting the sale of Japanese goods already on hand or paid for though not received, but forbidding the ordering of any more Japanese goods and providing that all trade in Japanese goods would stop after the Chinese New Year, whether stocks had been sold or not.

During the first 10 days of July at the height of the agitation, the actual quantities of imports into Shanghai from Japan showed an amazing decline compared with the same period of 1918 (see Table LVI). Decreases in quantity in specific items ranged from 26 to 100 per cent for the 10-day period most of them being between 80 and 100 per cent. For the period from June to September, the monthly exports from Japan to China declined rather sharply, and whenever it was possible orders were canceled, but the Sino-Japanese trade for the entire year 1919 was generally above the 1918 level; and the annual, or even monthly trade returns, taken by themselves, do not show any effect of the boycott. It is only when the rest of the trade of China is studied in relation to the imports from Japan that the effect of the 1919 boycott can be gaged.

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[1] *North China Herald, op. cit.*, p. 560, Aug. 30, 1919.

TABLE LVI.—CHINESE IMPORTS FROM JAPAN RECEIVED AT SHANGHAI, FIRST 10 DAYS OF JULY, 1919, COMPARED WITH 1918[1]

Goods	Unit	Quantity		Percentage decrease, 1919
		1918	1919	
Cement	Pounds	586,080	......	100
Clothing	Dozen	42,158	2,042	95
Coal	Tons	39,314	15,417	61
Cotton yarn	Pounds	533,544	97,284	82
Raw cotton	Pounds	674,784	......	100
Gunnies	Pieces	241,550	27,000	89
Household utensils	Dozen	5,273	233	96
Matches	Gross	107,900	15,900	85
Mirrors	Dozen	2,634	......	100
Brass materials	Pounds	46,464	15,708	66
Iron materials	Pounds	285,384	3,168	99
Paper	Pounds	519,552	80,124	85
Piece-goods	Pieces	104,299	77,604	26
Sugar (refined)	Pounds	3,013,296	936,276	69
Umbrellas	Pieces	78,403	......	100

[1] From Chinese Maritime Customs Returns, published in the *North China Herald*, *op. cit.*, Aug. 9, 1919.

In 1919, imports into China from Japan, compared with the 1918 trade, actually increased in spite of the boycott. The increase amounted to 3.4 per cent, but at the same time the rest of the import trade of China increased by 26.6 per cent, or relatively 7.8 times as much. Also, the boycott did not end with 1919. It continued into 1920 and 1921, and its effect in those years was much more evident. In 1920, China's imports from Japan declined by 7.2 per cent compared with 1919, while the rest of the Chinese import trade increased by 33⅓ per cent. China was very obviously placing her orders with other nations wherever possible. The year was marked by very wide fluctuations in the monthly trade returns from Japan and by a general tendency to decline. Japan lost in 1920 about $29,152,000 (gold) in trade to the China market. The effect of the boycott of 1919–1920 on Japanese trade was especially marked in the most important commodities of the Japan-China import trade: in sugar, piece-goods and cotton yarns, and in paper (see Figure 132). The paper dealers in Shanghai decided to handle no Japanese paper after July, 1919, and the lithographers and bookbinders agreed to pool their paper reserves until domestic supplies and imports from the United States and Europe had reestablished a normal supply. Japanese shipping, especially the river boats, also suffered severe losses.

It was the dream of the boycotters that during the period of the boycott there would be sufficient industrial development in China to make the country very largely independent of Japanese imports. While this dream has not been realized, there was a very positive development of Chinese industries directly resulting from the 1919–1920 boycott. A tooth powder factory was opened in Hangchow to replace the product previously supplied by Japanese manufacturers. In Canton, the manufacture of hats, singlets and umbrellas, which had been only a local industry, was expanded to supply the demand in central China. Many large orders were placed during the boycott agitation with American and British firms in Shanghai for cotton mill machinery that has since been set up in Chinese mills and is contributing to the elimination of Japanese yarns from the import trade (see Figure 132). Match factories were established in various parts of China, and since 1919 and 1920, the Japanese match has been almost entirely eliminated from the Chinese trade (see Table LVII). At Shanghai, an umbrella factory capitalized at $200,000 (Mexican) was erected and arrangements were made for a large toothpick factory. At Kalgan, a wool spinning plant and a tannery were erected as a direct result of the boycott. These are isolated instances that were reported at the time in the local press. It is impossible to determine the full extent of the movement. Certainly, the boycotts have effected a permanent expansion in Chinese industrial development.

TABLE LVII.—EXPORTS OF JAPANESE MATCHES TO CHINA[1]

Year	Value in thousand dollars, gold
1918	2,051
1919	2,934
1920	1,666
1921	451
1922	289
1923	127
1924	133
1925	205
1926	479
1927	405
1928	164

[1] Financial and Economic Annual of Japan, *op. cit.*, 1925, 1928.

The Japanese did not submit calmly to the boycott. They tried every possible means to escape it. The government again and again brought pressure to bear on the Chinese officials at Peking, which resulted in numerous mandates against boycotting but had no practical effect. The Japanese merchants removed their labels of "Made in Japan." Some even substituted British and American labels. The government landed marines who engaged in brawls with students, but the boycott continued through 1920 and into 1921.

The 1921 *Boycott*

In 1921, the whole boycott movement was rekindled by the reopening of the Shantung controversy and by Japan's insistence on direct negotiations with China and China's desire to have the matter settled under the auspices of the Washington Conference on Limitation of Armaments in connection with which Pacific and Far Eastern questions were discussed. The matter was settled in Washington by direct negotiations between Japan and China outside the Conference but in the presence of friendly nations, and an agreement was finally concluded in February, 1922. The pressure of international opinion at the Conference induced the Japanese to return Shantung to China and removed a dangerous obstacle to peaceful trade relations between the two nations. Throughout 1921, however, and into 1922, before the matter was settled, the boycott continued in China both for the purpose of bringing pressure to bear on Japan in the Conference and also to keep the Chinese leaders conscious of the attitude of the people. The 1921 trade from Japan suffered a heavy decline. Chinese imports from Japan were 8.2 per cent below 1920, while other Chinese imports were 30.5 per cent above the 1920 trade. Compared with 1919, imports from Japan declined nearly 15 per cent and the rest of the import trade of China increased 74 per cent. The decline in Japan's export trade to the China market in 1921 amounted to nearly $87,000,000 (U. S.) or nearly 14 per cent of the total export trade of Japan for 1921. It cannot be denied that the 1919–1921 boycotts, whatever they cost China, resulted in considerable success. They prevented the signing of the Peace Treaty; they corrected conditions in the home government; they brought about the return of Shantung; and they inflicted considerable economic loss on Japanese trade, shipping and industry.

The Boycott of 1923

The original lease of Kwantung to Japan would have expired in 1923, but under the compulsion of the Twenty-one Demands, China was forced to amend the term of the lease to 99 years, an extension to 1997. In the early part of 1923, as the original date for the return of the territory to China drew near, the Chinese government sought to persuade Japan to cancel the 1915 treaty and return Kwantung under the original agreement. Japan's refusal of China's request was the occasion for another anti-Japanese boycott. It began in April and was marked by demonstrations very similar to previous boycotts. Students, merchants, chambers of commerce, tradespeople, and laborers were again united in a patriotic movement against Japan. Japanese bank notes were again refused and deposits withdrawn from Japanese banks; wharf coolies refused to handle the cargoes for Japanese ships; and Japanese marines and bluejackets again engaged in petty combats with the students. In the Chinese press of Shanghai, the following notice was given prominence: "People should regard the Japanese goods as poisonous. Do not supply the cruel people with rice and wheat." In May, all over the country, "Humiliation Day" was observed. Newspapers reproduced, enclosed within heavy black borders, the full text of Japan's ultimatum to China of May 7, 1915. Students demonstrated with banners bearing the following inscriptions: "Don't forget the National Humiliation," "Don't Recognize the Twenty-one Demands," "Recover Port Arthur and Dairen at the Risk of Death," "Boycott Japanese Goods." In July, the Japanese government prevailed upon the Chinese authorities to issue a proclamation prohibiting any further boycott of Japanese goods, but in spite of official mandates, the movement continued actively until October. Then, without any definite occasion like the Washington Conference or the Peace Conference upon which pressure could be brought to bear, the boycott dwindled away. During the nine months from April to December, however, Japanese exports to the China market declined by $34,498,500 (U. S.) or 19 per cent compared with the preceding year. That a large part of this decline was due to the boycott is certain because, while the rest of the Chinese import trade declined slightly, the decrease in China's imports from Japan was relatively fifty times as great. The factors that were responsible for the decline in the total trade of China were not the major cause of the decline in Japan's exports to China. In specific commodities, the effect of the boycott was especially marked. Japanese piece-goods to China fell off 8 per cent from the previous year, sugar dropped 25 per cent, and cotton yarns 43 per cent. The years from 1919 through 1923 might almost be considered one long boycott against Japanese goods. Certainly, the Japanese trade with China during that period was not long free from boycott disturbances, and the relations of the two countries were decidedly strained and depressed (see Figure 131).

In 1925, a boycott was started against the Japanese and also against the British following strikes in some of the Japanese mills and the unfortunate incident in Shanghai on May 30 which grew out of these strikes and resulted in the death of several Chinese at the hands of the police under the command of an Englishman. For a time, the Japanese and British seemed to suffer equally from the general boycott of goods and the severance of all commercial and financial intercourse, but the tactics of the boycott leaders were suddenly changed in July and the boycott was narrowed down to and centered on Hong Kong and the British to the exclusion of the Japanese. In fact, Japanese trade later benefited very considerably by the boycott against British goods,

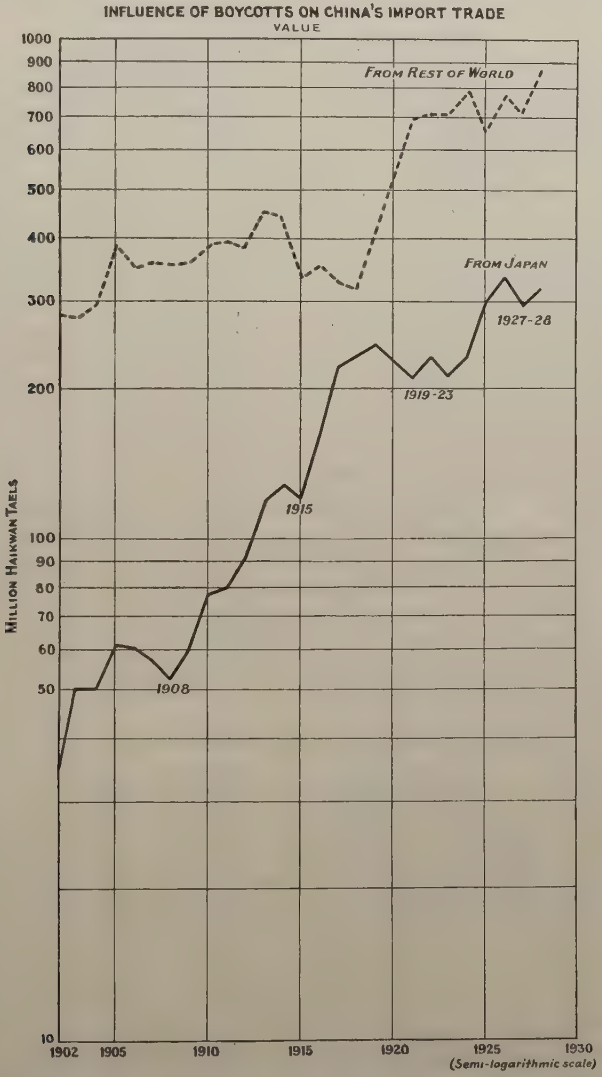

FIG. 131.—In the boycott years since 1919, Japan has failed to hold the position in the import trade of China gained during the World War. (One haikwan tael equals 583.3 grams of silver; its gold value varies with the price of silver.)[1]

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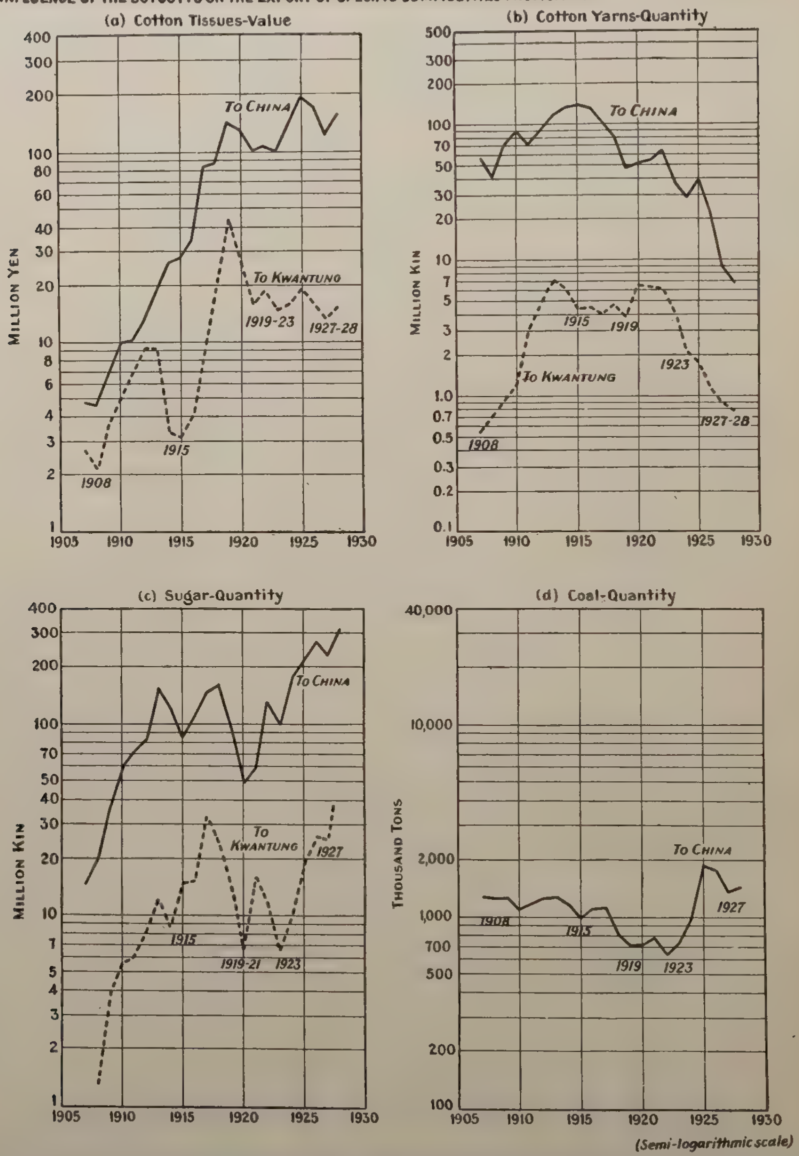
[1] Data from Foreign Trade of China, *op. cit.*



INFLUENCE OF THE BOYCOTTS ON THE EXPORT OF SPECIFIC COMMODITIES FROM JAPAN TO CHINA AND KWANTUNG

(a) Cotton Tissues-Value

(b) Cotton Yarns-Quantity

(c) Sugar-Quantity

(d) Coal-Quantity

(Semi-logarithmic scale)

FIG. 132.—(*a*) In 1925 and 1926, Japan was able to increase her trade in cotton piece-goods because of the boycotts against the British. (One yen equals $.498, gold.) (*b*) The elimination of cotton yarn from the Sino-Japanese trade began with the boycott of 1915 and has been completed by the succeeding boycotts. (One kin equals 1.32 pounds.) (*c*) The sugar market has been very greatly disturbed by the boycotts because China is almost the only customer of the Japanese sugar exporters. (*d*) The export of coal from Japan to China has declined with each boycott.[1]

[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

and the years 1925 and 1926 were decidedly good years for the Sino-Japanese trade.

The Tsingtao Incident of 1927

During the disturbed conditions and civil warfare of May, 1927, the Japanese government landed troops in Tsingtao ostensibly to protect Japanese nationals and property, but the move brought about a clash between Japanese troops and Chinese citizens and resulted in the death and wounding of a number of Chinese. Again the people were roused to resentment and another anti-Japanese boycott ensued. From June to December, the trade to China declined by nearly $9,500,000 (gold), but a good deal of trade came into China from Japan through Hong Kong and Kwantung, and the actual decrease in Japanese exports to the China market amounted to about $2,735,000 in the seven months. The unsettled conditions in China were undoubtedly a partial cause of the depression in trade in 1927, for Chinese imports in general showed a decline from the 1926 level, but the decrease in imports from Japan was relatively half again as great as the drop in the rest of the import trade. The boycott was without doubt an important factor in the more severe depression of the Japanese trade. It was especially noticeable in exports of piece-goods, cotton yarns, coal, and sugar (see Figure 132).

TABLE LVIII.—EFFECT OF CHINESE BOYCOTTS ON JAPANESE EXPORTS OF REFINED SUGAR[1]

Year	Total sugar exports from Japan, 1,000 pounds	Sugar exports to China and Kwantung, 1,000 pounds	Percentage of total
1921	105,000	100,000	95.3
1922	187,000	186,000	99.5
1923[2]	139,500	138,000	99.0
1924	142,400	142,000	99.7
1925	316,000	313,000	99.1
1926	397,100	388,000	97.8
1927[2]	347,000	324,000	93.2
1928	502,000	461,000	92.0
Percentage decrease in boycott years compared with preceding year			
1923	−25.2	−25.8	
1927	−12.3	−16.3	

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, and Mitsubishi *Monthly Circular*, *op. cit.*, March, 1928.

[2] Boycott years.

The Shanghai sugar traders, in order to protect their interests, established an auction market—Kung Mai Chu—in August and agreed to refrain from transacting business with the Japanese. The opening of this market dealt a severe blow to Japan's sugar trade, for in the period since there has been an export surplus, practically all of Japan's export sugar has gone to China (see Table LVIII). In 1927, the export of sugar to China from Japan declined by more than 16 per cent in volume from the preceding year. To replace the Japanese sugar, large consignments were received from Hong Kong and the Dutch East Indies. The auction market was abolished in the early part of 1928.

The Tsinan Incident in 1928

In China Proper, the boycott of 1927 lasted over into 1928 and was rekindled and set going anew by several unfortunate incidents between Japanese troops and Chinese citizens, especially the affair in Tsinan in May, 1928, which also grew out of the stationing of a detachment of Japanese troops in Shantung at the time of some internal disorders. Immediately following the Tsinan incident, new boycott committees were formed and telegraphic orders were sent out to cancel all contracts and orders placed with Japanese shippers. The month of May with its numerous anniversaries that serve as "Humiliation Days" has become the occasion for almost yearly demonstrations against the Japanese. It is the danger period in Sino-Japanese trade relations that Japanese shippers watch closely for signs of renewed agitation.

The 1928 boycott was characterized by more effective organization than had previously been the case, and the agitation appeared to come from the merchants and the shipping hongs rather than from the student class. In every important center boycott committees were formed that undertook to register Japanese goods on hand in the local shops and to fine the merchants holding goods not registered or ordered after the boycott began. Confiscated goods were not burnt in public demonstrations as in 1919 and 1920, but were held in storage or sold at auction, the proceeds going to finance the boycott movement. The Peking Anti-Japanese Boycott Association is reported to have collected $42,000 (Mexican) in the form of fines and registration fees in 1928 and early 1929. The Tientsin Association in July, 1929, was reported to have accumulated a balance of about $400,000 and the Shanghai Association a balance of $750,000 local currency. These sums have not been certified, but it would appear that the amount for the Tientsin Association, at least, was not exaggerated. According to the Chinese manager of an American company supplying spinning and knitting machinery, his firm was asked in 1929 by the directors of the Anti-Japanese Boycott Association of Tientsin to supply, for cash, suitable American machinery for the establishment of a woolen yarn spinning and knitting factory to be organized under the auspices of the association. The capital outlay contemplated for the factory was about $250,000 (Mexican) to include machinery to the value of about $100,000, land, buildings, and operating expenses. It was also understood that the Association had made a grant of $50,000 to the Society for Promoting the Use of Native Products. The remaining $100,000 was to become the working fund of the association reorganized, because of the termination of the boycott, as the Association for the Abolition of Unequal Treaties.

In the earlier boycotts, the Japanese cotton mills in China had been able to render the boycotts against them less effective by selling their products at from 4 to 6 per cent less per bale than the Chinese competitors. But in 1928 and 1929, the boycott committees, intent on inflicting loss on these mills, organized a bureau to collect part of the discounts and to issue permits for the goods to move to the interior. The fine system enriched the treasuries of the boycott committees and resulted in much heavier losses to the mills, especially as they felt compelled to continue to manufacture at a loss to keep the organization together and to hold on to old markets for the future.[1] The Japanese Spinners' Association in China estimated the extent of their loss in 1928 at more than $1,000,000 (gold) monthly.[2]

Upon the completion of the negotiations on the Hankow, Nanking, and Tsinan incidents and the withdrawal of the Japanese troops from those cities, the boycott came to an end by official proclamation from Nanking in May, 1929. In the meantime, it had done considerable damage to the Japanese trade. The value of Japanese exports to China for the year 1928 increased in comparison with 1927, but 1927 was itself a boycott year and a year of civil strife in China. Compared with the year 1926, the trade with China, Hong Kong, and Kwantung declined in 1928 by $17,500,000 (gold). The boycott also continued into 1929, and for the first five months the loss in trade amounted to an additional $19,137,000 (gold) compared with 1926. The disturbed internal conditions in China might be held responsible for part of this decline, but the boycott was undoubtedly the most important cause. According to the Chinese Maritime Customs returns, imports from Japan decreased by 5.2 per cent in 1928 compared with 1926, while imports from other nations increased by 11.3 per cent.[1]

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[1] *American Chamber of Commerce Bulletin*, Shanghai, August and September, 1928.

[2] *Trans-Pacific*, *op. cit.*, p. 21, Jan. 19, 1929.

It was estimated in the *North China Herald* in August, 1928, that the Japan-China trade had already experienced in that year a loss of $16,000,000 (gold), $6,000,000 of which was said to be in goods stocked in Shanghai and $10,000,000 in goods undelivered from Japan. The significance of these figures lies in the fact that, unquestionably, large quantities of goods were unable, because of the boycott, to move through their natural channels and that trade was greatly disrupted, even if only temporarily. The actual loss to Japan caused by this interruption in the flow of goods cannot be estimated and is not reflected in the trade returns. Although the trade returns that were published in Japan in 1928 and early 1929 were consistently optimistic, Japanese merchants were not pleased with their share in this trade, for a large part of their goods was tied up in warehouses in Shanghai and other port cities of China.

The 1928 boycott, both through the agitation against Japanese goods and the encouragement of the establishment of Chinese factories, practically completed the elimination of Japanese matches and Japanese cotton yarn from the China trade. Aquatic exports to China also continued to fall off. Important classes ot piece-goods declined, but the value of the whole piece-goods trade was greater in 1928 than in 1927 though considerably less than in 1926. The boycott of coal was not strictly enforced because of Shanghai's dependence on Japanese coal, but exports of coal did not increase over the previous year. On the other hand, sugar and paper exports increased in spite of the boycott. In the first six months of 1929, however, trade in practically all of the important exports to China declined in comparison with the first half of 1928. Cotton tissues and yarns, sugar, coal, and paper showed the effects of the boycott.[2]

THE COST OF THE BOYCOTTS TO THE CHINESE

It has been openly stated in the foreign press of China that the boycotts of recent years were less a patriotic movement than a Chinese form of racketeering. While undoubtedly there were individuals who made of the boycott a means of personal gain, the widespread adoption of the boycott, the participation of merchants and chambers of commerce at considerable financial loss, the encouragement given by the boycott committees to Chinese industries, and the direct use of the boycott to force Japan, in the negotiations of the various "incidents," to withdraw her troops from China's soil as a preliminary to the cessation of the boycott are strong evidence of a more serious menace to Japanese trade than organized racketeering.

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[1] For purposes of comparison, the year 1926 is somewhat abnormal since Japanese trade with China was increased considerably by the Chinese boycott on British goods. But even if comparison is made with the average annual trade for the four-year period 1924 to 1927—a period including two years of anti-British boycott, one year of anti-Japanese boycott, and one more or less normal year—Japanese exports to the China market declined in 1928 by $6,500,000 (gold). In the first five months of 1929, Japan's export to the China market declined by $1,526,000 (gold) compared with the same months of the period 1924 to 1927. In the Chinese trade returns, imports from Japan increased in 1928 in comparison with the average trade of 1924 to 1927, but imports from the rest of the world increased in the same period relatively over twice as much.

[2] Trade reports on China in Mitsubishi *Monthly Circular*, *op. cit.*, July, August, and September, 1929.

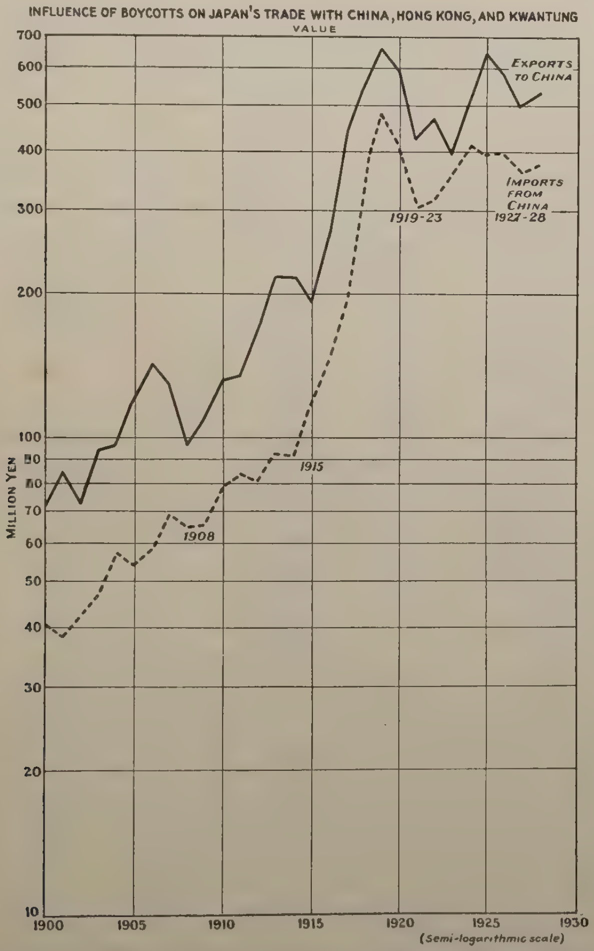

FIG. 133.—The boycotts in China have affected Japan's export trade to the China market, and in almost the same degree they have curtailed Japan's import trade from China.[1]

[1] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

The foreign press has also taken issue with the Chinese on the economic effectiveness of the boycott. They point out that with the decline in exports from Japan to China there have been corresponding and proportional declines in exports from China to Japan (see Figure 133). The two trades run in almost parallel lines, and the contention is that China by the loss in exports to Japan and the loss in customs revenue on the boycotted Japanese goods suffers as much harm from the boycott as Japan. They claim that the boycott as an economic weapon between nations is therefore ineffective.

TABLE LIX.—KWANTUNG'S INCREASING SHARE IN THE JAPAN-CHINA TRADE, 1907 TO 1928[1]

Year	Japan's exports to Kwantung, thousand dollars, gold	Percentage of total Sino-Japanese trade
1907	10,200	15.6
1908	8,619	17.9
1909	8,098	14.6
1910	9,574	14.4
1911	11,531	17.0
1912	13,772	16.1
1913	14,918	13.7
1914	11,135	10.2
1915	11,100	11.6
1916	18,530	14.0
1917	32,862	14.9
1918	58,190	21.6
1919	75,063	22.9
1920	56,843	19.0
1921	38,784	18.3
1922	35,929	15.3
1923	33,935	17.2
1924	36,300	14.5
1925	50,823	15.8
1926	49,803	17.4
1927	45,635	18.6
1928	55,095	20.6

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

To such criticisms, the Chinese reply that the boycott, like war, is a patriotic movement in which they are prepared to take some loss for the sake of the losses they inflict. In every boycott, the Chinese have deliberately placed restrictions on certain exports to Japan. Rice and wheat, as vital foodstuffs, have been cut off from export by the definite action of the boycott committees. The Chinese, too, took very heavy losses to themselves in the widespread destruction of Japanese goods that had been bought and paid for, especially in the boycott of 1919 and 1920. In the 1928 boycott, the stocks of Japanese goods that were withheld from commerce in the warehouses of Shanghai and the other port cities of China resulted in losses to Chinese merchants nearly equal to the losses to Japanese shippers. The strikes that were called in the Japanese mills in China in order to harass the management and boycott the product resulted in throwing hundreds of Chinese laborers out of work.

It has been suggested that Japan's sphere of influence in Kwantung offers a port of entry for Japanese goods into China during the boycott periods and that the trade with Kwantung has been able to offset a large part of the effect of the boycotts. This is true in part. In the earlier boycotts, the Kwantung trade appears to have suffered nearly equally with the trade to China Proper, but in 1927, 1928 and 1929, a great deal of goods from Japan did enter China by way of Kwantung and also Hong Kong. The Japan-Kwantung trade appears to be growing and absorbing a larger and larger proportion of Japan's exports to the China market, as is shown in Table LIX.

SUMMARY OF EFFECTIVENESS OF THE BOYCOTTS

The losses suffered by the Chinese in their economic warfare and the measures that Japan has been able to take to counteract the boycotts do not alter the fact that the boycotts have been effective and that Japanese trade and Japanese industries have suffered very seriously. The success of the boycott manoeuvers has rested upon Japan's economic dependence upon China which is much greater than China's economic dependence upon Japan. The proportion that each country has of the other's foreign trade is about on a parity, but China is much less dependent upon her foreign trade than is Japan. The use of the boycott could not be made effective against any and every nation, but against Japan it has proved a powerful defensive weapon. In Table LX is summarized Japan's loss in export trade to the China market during each of the boycotts. Except in 1919, which was an unusual postwar year, there has been a decided falling off in trade in the boycott months, ranging from 0.3 per cent of the total Japanese export trade in 1927 to 13.9 per cent of Japan's exports in 1921. The percentage fluctuations in China's imports from Japan and from the rest of the world in the boycott years compared with the previous year, as presented in Table LXI, indicate that the boycotts were the major factor in depressing Japanese trade, for the decline in imports was relatively much greater from Japan than from the rest of the world for each boycott year except the war year 1915, which has been explained above. With each successive boycott against Japan, the technique has been improved and it has become increasingly easy to organize new boycotts. The

TABLE LX.—JAPANESE EXPORTS AS A MEASURE OF THE EFFECTIVENESS OF THE BOYCOTTS ON JAPANESE TRADE IN THE CHINA MARKET[1]

Boycott periods	Increase or decrease in exports to China, Hong Kong and Kwantung in the boycott periods compared with similar periods of previous year		
	Value in dollars, gold	Percentage of exports to China market	Percentage of total Japanese exports[4]
April–December, 1908	−13,332,000	−26.9	− 7.05
January–June, 1915	−17,900,000	−29.0	− 5.05
May–December, 1919[2]	+32,385,000	+17.0	+ 3.1
January–December, 1920	−29,152,000	− 8.9	− 3.0
January–December, 1921	−86,961,000	−29.0	−13.9
April–December, 1923	−34,498,500	−19.0	− 4.8
June–December, 1927	− 2,735,000	− 1.8	− 0.3
January–December, 1928[3]	−17,453,000	− 3.0	− 1.8
January–June, 1929[3]	−19,137,000	−14.5	− 1.8

[1] Computed from data published in Monthly Returns of the Foreign Trade of the Empire of Japan, *op. cit.*

[2] For a better measure of the Boycott of 1919, see Tables LVI and LXI and the text.

[3] As 1927 and 1928 were boycott years, comparison for the boycott periods in 1928 and 1929 is made with the more normal year 1926. See also note 1, page 468.

[4] The percentages in this column are based upon the total Japanese export trade for the same year as the boycott.

TABLE LXI.—CHINESE IMPORTS AS A MEASURE OF THE EFFECTIVENESS OF THE ANTI-JAPANESE BOYCOTTS[1]

Boycott years	Percentage increase or decrease in the value of Chinese imports compared with previous year	
	Imports from Japan	Imports from rest of world
1908	− 8.6	− 1.9
1915[2]	− 5.4	−24.4
1919[3]	+ 3.4	+26.6
1920	− 7.2	+33.3
1921	− 8.2	+30.5
1923	− 8.8	− 0.17
1927	−12.8	− 8.6
1928[3]	− 5.2	+11.3

[1] Computed from Foreign Trade of China, *op. cit.*, 1907–1928.

[2] The year 1915 being a war year, imports from other countries declined relatively much more than imports from Japan, but the fact that Japan's share in the China trade declined also, when Japan might have supplied the goods the warring nations could not send in, is decidedly a mark of the boycott.

[3] As 1927 was itself a boycott year, comparison is made with the more normal year 1926. See also note 1, p. 468.

pressure of the boycotts has been sufficient to influence the diplomatic relations of the two nations and to enter as a major factor in determining the terms of Sino-Japanese agreements. The recurrence of boycotts again and again has reacted unfavorably on Japanese industries and has disturbed the economic well-being of the nation. In these respects, at least, the boycott has been an effective weapon for China, and Japan has been a heavy loser in this economic warfare.

Not only have the boycotts had a direct and tangible effect upon Japanese trade, but the propaganda that has been a part of each boycott is bound to jeopardize the future trade relations of the two countries. The propaganda that has been spread over China almost continuously since 1915 is typified in the Manifesto of the National Anti-Japanese Conference of 1928, a translation of which is quoted below. Its influence cannot be measured, but its repetition year in and year out becomes a serious menace:

> People of China! The country suffers under the yoke of imperialism. We have held our National Anti-Japanese Conference in Shanghai from July 21 to 27 and have passed a series of resolutions regarding the methods to be adopted in dealing with Japan, which country has been oppressing China more harshly year after year. Japan has caused China to accept her preposterous demands and has forced China to conclude unequal treaties with her. Japan, herself, was at one time oppressed by other nations and she thinks it is now her turn to oppress China.
>
> Our Association has been organized as the result of the May 3 tragedy at Tsinan. It is now evident that the hour of "life or death" between China and Japan has come. We have become, therefore, more determined than ever to overthrow Japanese imperialism even at the cost of our lives.
>
> However in our efforts to overthrow Japanese imperialism, we must pay great attention to the following points:
>
> 1. To overthrow the influence of Japan's imperialism in China, we must first get rid of the Japanese "tools," *i.e.,* the Northern Militarists who, from time to time, have been exploited by the Japanese. Let us unite and support the Chinese Kuomintang. Let us rid ourselves of the "tools" of Japanese imperialism in China and adopt measures to block all their further developments!
>
> 2. Japanese imperialism depends on financial penetration for its existence. Therefore, we must crush Japan's financial influence in China to overthrow her imperialism. This latter can easily be attained by securing the abrogation of all unequal treaties existing between China and Japan. We must strive to obtain custom autonomy in order to foster the growth of our national products. It is likewise an absolute necessity that the severance of economic relations with Japan be enforced, and this must be carried out at all costs.

3. China is not the only country in the world that has fallen a victim to Japan's financial penetration; Korea and Formosa have likewise met a similar fate. On the one hand, we must, therefore, do our very best to guide our people to struggle hard against Japanese imperialism, and on the other hand, we must direct the people of all small and weak nations to likewise fight against Japan's imperialism.

4. Our previous anti-Japanese movements have all resulted in failure, the principal cause of this being due to lack of proper leadership and uniformity in our activities. We must now conduct our efforts harmoniously so that our objective of racial emancipation may be attained.

The May 30 and May 3 incidents have helped us considerably in our efforts to secure racial emancipation. Those Japanese imperialists who caused these two incidents have dug their own graves.[1]

CHINA'S TARIFF AUTONOMY

Another very important factor, not operative in the past, entered Sino-Japanese trade relations in 1929. In the early part of the year, the major powers granted China her long-sought tariff autonomy, and in February the Chinese government promulgated a new tariff law. Though moderate in its rates, the new tariff was revolutionary in policy and marked the beginning of a new era in Chinese commerce. Japan accepted the principle of China's tariff autonomy with the other nations, but the details were not arranged and the formal Sino-Japanese tariff treaty was not signed until May 6, 1930. It is now presumably a matter of a short time until China will be entirely her own master in the matter of tariffs and fully able to protect her manufacturing industries. Protective tariffs in China will inevitably limit the market for Japanese goods, they will alter the character of China as an international market with perhaps far-reaching effects. In every boycott, it has been the dream of the leaders, not only to shut out Japanese goods, but to stimulate the development of manufacturing industry in China and to make China permanently independent of much of the manufactured goods from abroad. The Chinese government now has the means of realizing her industrial ambitions by protecting her infant industries and fostering them through the uncertain years of their development.

TRADE WITH THE REST OF ASIA

One result of the anti-Japanese boycotts has been to Japan's advantage. Under pressure of canceled orders and dislocated trade, Japanese shippers have made strenuous efforts to secure new markets for Japanese goods. The export market is being diversified and Japan's dependence upon the China trade appears to be declining. Trade with the rest of Asia, which the Japanese have been pushing energetically since 1915, is the logical field for expansion of Japanese exports. Southeast Asia, especially, is nearer Japan and closer in culture to Japan than to the other industrial nations. If, as Baron Makino has said, trade with peoples of less industrial development is easier and more profitable than with more highly developed nations, then southeast Asia would seem to be an inviting field for the expansion of Japanese trade. The area is not industrialized and is not likely to develop in that direction in the near future. It offers an excellent market for Japanese goods in exchange for the food and raw materials which it supplies to Japan. During the World War, the Japanese developed a large trade with the Dutch East Indies, Malaya, and the Philippines; and when the European nations returned to this trade, Japan was able to hold on to some of the gains she had made although she lost a great deal by their return (see Figure 134). During the past 15 years, Japan has made vast permanent gains in the trade of southeast Asia. It is a market in which she can compete on an equality with the other commercial nations.

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[1] *North China Herald*, *op. cit.*, Aug. 4, 1928.

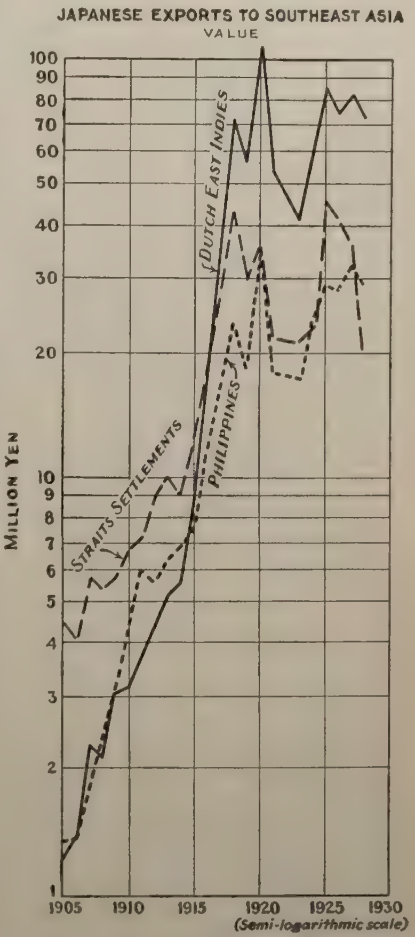

FIG. 134.—The rapidly increasing trade of Japan with southeastern Asia has been seriously disturbed by the Chinese boycotts. (One yen equals $.498 U. S.)[1]

Sensing the economic advantage that Japan could gain by directing her stream of trade away from China into the other countries of Asia, the Chinese, in 1928 and 1929, spread their boycott activities into Indo-China, Siam, the Dutch East Indies, Malaya, and the Philippines; and the Japanese trade consequently suffered severely. In all of those countries, the merchant class is very largely Chinese, and this fact places them in a strategic position to boycott Japanese goods more effectively than their numbers would otherwise make possible. In 1928, Japanese exports to every single one of the five countries declined. Trade with the Straits Settlements fell off over 44 per cent compared with the previous year. Exports to the Dutch East Indies dropped 11 per cent, to the Philippines 11.5 per cent, to Indo-China 30 per cent, and to Siam 48 per cent. In the first five months of 1929, exports to the Philippines and the Dutch East Indies increased over the same period of 1928, but to the other countries—Indo-China, Siam, and Straits Settlements—the trade continued to decline. There may have been other influences that contributed to these trade depressions, but in view of the active agitation that is known to have been carried on by the Chinese in each of these countries, it is certain that the boycott was at least a partial cause of the decline.

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[1] Data from The Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

Japan's trade with southeast Asia is very largely in cotton textiles (see Table LXII). It is not a market with a large demand in the other products of Japanese export. Cotton tissues make up about 47 per cent of the Japanese export to this section of Asia, but the market could absorb a great deal more, for it is estimated that Japan supplies only about one-fourth of the import demand for cotton goods in this area.

TABLE LXII.—IMPORTANT EXPORTS TO SOUTHEAST ASIA FROM JAPAN[1]
(Four-year average, 1924 to 1927)

Goods	Dutch East Indies		Straits Settlements		Philippines	
	Value in thousand dollars, gold	Percentage of total	Value in thousand dollars, gold	Percentage of total	Value in thousand dollars, gold	Percentage of total
Cotton tissues	22,536	59.6	5,503	30.2	4,875	34.4
Knit goods	880	2.4	315	1.7	2,026	14.3
Silk tissues	1,042	2.8	915	5.0	713	5.0
Pottery and glass	2,878	7.6	1,271	6.9	743	5.2
Coal	......	....	1,145	6.3	985	6.9
Aquatic products	......	....	836	4.6		
Matches	302	0.8	666	3.7		
Total	27,638	73.2	10,651	58.4	9,342	65.8
Grand total	37,778	100.0	18,225	100.0	14,183	100.0

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927.

British Indian Trade

Of equal proportions to the trade with southeast Asia is the British Indian trade. It amounts to about 8 per cent of the total Japanese exports and is almost entirely a trade in textiles, especially cotton textiles which constitute more than two-thirds of the total. Cotton tissues constitute 43 per cent of the trade, cotton yarns, a trade that is fast disappearing, constitute over 19 per cent, and cotton knit goods 5 per cent. The other commodity of importance in the trade is silk cloth which amounts to about 8 per cent of the total value. The silk import market is not a large one in India and the trade is divided between China and Japan. About one-half of the imports come from Japan and 42 per cent from China.[1] It is questionable if Japan will be able to increase her share, especially if China's industrial ambitions prove serious. In the competition for the market, Japanese producers of silk tissues have no special advantage over the Chinese. The Japan-India trade along other lines does not appear to be making much progress (see Figure 135).

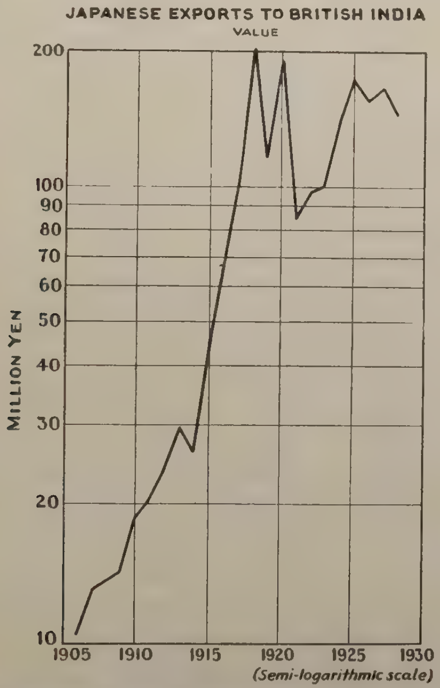

FIG. 135.—The export trade to India would appear to have reached its peak and to be at a standstill for the present. (One yen equals $.498, gold.)[2]

OTHER POSSIBLE MARKETS FOR JAPANESE EXPORTS

Aside from the United States and Asia, there are at present no markets of outstanding importance or great promise for the Japanese.

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[1] Estimated from Sea-borne Trade and Navigation of British India, *op. cit.*

[2] Data from Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*

These two markets have always taken the bulk of Japan's trade and now absorb 85 per cent of her export products (see Figure 129). Of the remaining 15 per cent, Europe takes nearly half, but industrialized Europe does not offer much prospect of expansion for Japanese trade. Most of the nations of Europe are seeking to sell their own manufactures in world markets. Japan has more chance of extending her trade in less developed areas.

TABLE LXIII.—THE IMPORTANT JAPANESE EXPORTS TO BRITISH INDIA[1]
(Four-year average, 1924 to 1927)

Goods	Value in thousand dollars, gold	Percentage of total
Cotton tissues	34,247	43.3
Cotton yarns	15,349	19.4
Knit goods	4,069	5.1
Silk tissues	6,628	8 4
Glass and pottery	3,088	3.9
Total	63,381	80.1
Grand total	79,039	100.0

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[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927.

South America is a large market for the industrial products of the United States and Europe, but as has already been indicated in the discussion of the cotton textile exports in the previous chapter, Japan has never obtained a real hold on this market. Her South American exports amount to only 1 per cent of her total exports and the trade is not increasing in any marked degree. During the World War, it was expanded a little, but most of the war gain has since been lost.

The African trade, on the other hand, has shown healthy signs of growth. It is about twice as large as the trade with South America, but the trade is also confined to textiles. Cotton tissues constitute 60 per cent of the exports to Africa, silk tissues 15 per cent, and knit goods 7 per cent.

Australia, New Zealand, and Canada are frontier lands that might serve as excellent markets for Japanese products. The per capita consumption is high and the demand for manufactured goods relatively great. Together, they now take less than 4 per cent of the Japanese exports. Australia is the most important of the three markets, and the yearly total of the Japanese exports to that market is only about $25,000,000 (gold). All three of the countries are colonies of the British Empire and as such have established for British goods preferential tariffs that have been sufficient practically to eliminate Japanese goods from the trade. What trade there is, is confined very largely to silk and cotton textiles. The inauguration of any trade in other Japanese products must always meet with competition under the British preferential tariff. The immediate future does not point to a large expansion of these trades.

TABLE LXIV.—JAPANESE EXPORTS TO AUSTRALIA, NEW ZEALAND, AND CANADA[1]
(Four-year average, 1924 to 1927)

Goods	Australia		New Zealand		Canada	
	Value in thousand dollars, gold	Per-centage of total	Value in thousand dollars, gold	Per-centage of total	Value in thousand dollars, gold	Per-centage of total
Silk tissues........	13,869	57.8	752	48.9	5,835	52.8
Cotton tissues.....	3,476	14.5	299	19.4		
Tea...............	......	....	.....	....	652	5.9
Pottery...........	518	2.2	.....	....	517	4.7
Total...........	17,863	74.5	1,051	68.3	7,004	63.4

[1] Annual Return of the Foreign Trade of the Empire of Japan, *op. cit.*, 1924–1927.

It has been the purpose of the last two chapters to analyze the probable developments in the Japanese foreign trade and to emphasize the significance of that trade in the progress of industrialization. There has been a remarkable increase in the foreign trade, but the balance has been consistently unfavorable and the export trade now depends upon two commodities, raw silk and cotton textiles, and upon two markets, the United States and Asia. The position of raw silk is threatened by the recent improvements in artificial silk and the growth of the rayon industry and by the possible development of the raw silk industry of China. The expansion of the cotton textile trade is limited by the spread of industrialization throughout the world and especially by the establishment of cotton textile manufacturing in almost every country. It is not likely that any manufacturing nation will ever be able to depend upon the export of cotton textiles to the same extent that Great Britain has done in the past.

The United States is a huge and rich market, but it takes little else than raw silk from Japan, and any threat to the raw silk trade is a threat to the trade with America. It will be difficult to develop trade in other products against the high tariffs that protect American industries. Asia seems to be the natural market for Japan and, next to the United States, China is Japan's best customer; but China has industrial ambitions and is encouraging the development of manufacturing.

Trade with China has been seriously disturbed not only by internal strife and civil wars but by the protracted boycotts against Japanese goods.

To insure industrial and commercial stability, it is imperative that Japan should diversify both her export commodities and her markets. She must develop other manufacturing industries with a surplus for export and expand her trade into other markets.

Chapter XXV

THE OUTLOOK FOR THE FUTURE

THE menace of an imperialistic Japan in the Pacific is a favorite bogey conjured up by ardent militarists, especially in the United States, to advance their demands for a large army and a large navy. It is a type of propaganda effective in many parts of this country and with martial individuals who wish to be convinced that a powerful, armed defense is essential, but it has little basis in fact. Japan has no intention of attacking the United States or of encroaching upon American possessions. The World War demonstrated beyond any question of doubt that military success today depends not upon the mass of numbers but upon the possession of fuels for power and of metals for the manufacture of machines and munitions and upon science and upon huge expenditures for supplies. In the earlier chapters of the present analysis of Japan's economic position, the poverty of Japan in coal, petroleum and iron ore, the precariousness of the Japanese financial position, and the dependence of the country economically upon the trade with the United States have been pointed out again and again. The Japanese leaders know the weakness of their country. They realize that a war with a major power would probably bring defeat and that it would certainly mean financial ruin to Japan, win or lose. Points of irritation and disagreement between the United States and Japan undoubtedly do exist, but Japan cherishes no deep-laid plots for the conquest of America. The great danger to the peace of the Pacific lies in the fulminations of the jingoes on its opposite shores, for Japan has jingoes too, but they write and they talk with as little knowledge of the facts as do the Xanthophobes and the Big Navy group in America. It is to be hoped that wiser heads will continue to rule. Some danger of conflict between Japan and the United States there may be in Japan's attempts to penetrate into China, but there should be no occasion for American intervention since it would seem that unless there is a complete national debacle China, supported by world opinion, will be able to protect her own interests.

THE YELLOW INDUSTRIAL PERIL

There are others who claim to see a different menace beyond the Pacific. Thinking archaically of manufacturing costs only in terms of wages to labor and not appreciating fully the revolution that the machine and power and factory organization have brought to industry, they hold the teeming millions and the low wages of the Orient to be a threat to western industry and commerce, and before every tariff-making Congress they parade the yellow industrial peril. Japan has made progress in the development of manufacturing, remarkable progress if the poverty of raw materials is considered, but as the present study has brought out, Japan has not reached an industrial stature comparable to that of England, the United States, or Germany. Her possibilities for industrialization are limited and there seems to be no prospect that Japan can attain a position of major importance as a manufacturing nation. Fuel and iron ore are essential in peace as well as in war and their scarcity is the principal obstacle to Japanese industrialization.

In iron and steel making and in the industries depending upon iron and steel, the West has nothing to fear from Japan, or from eastern Asia for that matter. Japan fared badly in nature's distribution of reserves of iron ore and of coking coal, and the supply of the two materials in the rest of the continent is also meager. In India alone is there an iron ore deposit of any present significance. The Japanese iron and steel industry will probably expand to some extent, but it will continue to depend upon government support for its existence. Though the Japanese iron and steel industry will supply a large part of the demand in the domestic market protected by a high tariff and by subsidies, Japanese industry and transportation will be handicapped by the necessity of purchasing equipment produced at costs higher than those prevailing in western countries. There will be no surplus of metals to flood other markets. If Asia makes any appreciable progress in industrialization, the resources of the continent for the making of iron and steel will probably prove inadequate to meet the demand thus created. Europe and North America, now contributing some 96 per cent of the pig iron and 97 per cent of the raw steel output of the world, will be called upon to supply the locomotives, the rails, the ships, and the machines for the new industrial order. An industrialized Orient will be not a competitor but a new market for the iron and steel industry of the West. If Japan makes any noteworthy progress with the metals, it will be in the manufacture of machines demanding relatively small quantities of steel in proportion to their value.

The industrial future of Japan seems to lie in the lighter, secondary industries in which raw materials of little bulk are highly fabricated, and especially in the textile industries. It is in those industries that the most striking progress has been made in the past 75 years and at present, as an earlier chapter has emphasized, approximately 50 per cent of the Japanese factory workers are employed in the reeling of raw silk, in the spinning of cotton yarn, in the weaving and finishing of cotton cloth, and in the minor textile industries. Many more workers are engaged in the same industries in establishments too small to be included in the factory statistics. The textile industries are the only important industries the raw materials for which do not constitute a heavy handicap to Japan. The cocoons for the silk filatures are the product of steep slopes unsuited to other forms of agriculture. The raw silk is now the very foundation of Japanese trade; it should be utilized to the fullest possible extent within the country in the development of a silk weaving industry for export.

Though little cotton is cultivated in Japanese territory, the fiber can be obtained readily and economically from India, the United States, China, and Egypt, and its importation is no handicap to the Japanese industry. In addition to raw materials, the textile industries also require skilful labor, power, though much less than do the metal industries, efficient machinery, resourceful management, and a dependable market, factors all of which are enjoyed by Japan or are within reach. The one serious obstacle to the expansion of the textile industries, especially the manufacture of cotton goods, is the industrial ambitions of Japan's most likely customers on the continent. Asia as a market for the cotton manufacturing countries of the West is undoubtedly on the wane. Japan is the leading contender for the trade and is gaining ground at the expense of Great Britain, hitherto the leading purveyor, but the Oriental consumption of cotton goods will be met in an increasing ratio by India and China, for in both countries industrialization has begun and, as is usually the case, it is making its first and greatest progress in cotton spinning and cotton weaving. Japan cannot expect to occupy a position in the cotton trade of Asia comparable to the position held by Great Britain for so many years in the trade of Europe and the rest of the world.

AN ORIENTAL INDUSTRIAL REVOLUTION

In her program of industrialization, Japan has taken over bodily the industrial system of the West, a system developed under very different circumstances than those prevailing in Japan. The English Industrial Revolution that has spread to the rest of Europe and to America and is now spreading to the Orient was the product of the seventeenth and eighteenth centuries. Its foundation was the substitution of mechanical power for hand power, and it happened that the source of mechanical energy most readily available was coal. Coal is bulky and expensive to transport, particularly with the methods of transport in use in eighteenth century England, and it was more economical to consume the coal near the mine mouth. Accordingly, the new industries concentrated on the coal fields and were highly centralized, the population was drawn from rural England, and great urban centers grew up. Today, the map of the British industrial regions and of large cities is almost identical with the map of coal deposits.

The English Industrial Revolution occurred among a people who already had considerable contact with the world and who were not afraid to break with familiar surroundings as had been demonstrated by the many colonists who had gone out to the new world, by the merchants with their connections in every land, and by the beginning of the British adventure in India and in the East Indies. There was little resistance in Great Britain to the movement to the new industrial centers. The industrial revolution found Japan an isolated country made up of isolated parts. The people were not accustomed to foreign travel and few of them had traveled even within their own islands. They were agriculturists and were scattered over the arable parts of the country. They were attached to the land and to their villages. Tradition and religion held them to their surroundings. They responded reluctantly to the call of the factory industries and even to this day there is no large body of factory labor in Japan. The modern factory industries experience difficulty in meeting their labor demands and must support expensive recruiting systems to persuade the workers to leave their homes even temporarily.

The English Industrial Revolution enlarged the size of the manufacturing unit and through its dependence on machines and engines, it increased greatly the importance of capital as an agent of production. The fortunes accumulated in the previous century by the merchants in their commercial ventures were available for the purchase of the new equipment and for the financing of the factories. In Japan, with its peasant background, there had been no such accumulation, and a scarcity of capital is still a handicap to many industries. It has been advanced as one explanation of the persistence of the small establishment in Japanese industry.

There is little more reason for the acceptance of an industrial system without change from another region than there would be in taking a diet, a language, a national costume, or a religion, for all are the product of a definite background and are related to their environment and may not be suited to another set of circumstances. It seems likely that in time the Japanese may realize that this industrial system which they are borrowing from the West is far from perfect and that it is not well adapted to Japanese conditions. A new industrial revolution may occur in Asia, more in harmony with the Oriental background and with modern technical progress. The necessity for the concentration of industries at some source of power no longer exists, for power in the form of electricity can be transmitted long distances from waterfall or coal mine. Because of the improvements in transportation and communication, centralization is not essential to the marketing of manufactured goods. There is little reason for the continued piling up of industries and of people in urban centers with all the attendant disadvantages and evils, and particularly in the face of the attachment of a people to their villages. It persists in the older manufacturing countries through sheer inertia, but Japan is young industrially and should be able to make the change to decentralized industry.

There are some evidences even in Europe and America that industry in the future may be more decentralized. There is the movement in the United States to take the manufacturing plants away from the large cities such as New York and Chicago; and the cotton textile industry is becoming increasingly decentralized through the migration of the mills from the New England cities to the towns and rural communities of the South. Henry Ford has adopted the policy of establishing plants for the manufacture of parts of his car in towns that are little more than rural centers. In that way he hopes to make use of the surplus labor of the agricultural districts and to halt the exodus to the cities.

Lyons, France, is a center of silk weaving. The industry began as a home industry in the city and in the adjacent rural areas. About the middle of the nineteenth century, it concentrated in factories of several hundred looms situated in Lyons and in the larger villages. Labor was difficult to obtain and girls were recruited from the rural districts and quartered in dormitories at the factories, essentially the system prevailing in Japan today. Then came the World War. The men were called to the army and upon the women fell the task of working the farm land. It became increasingly difficult to secure labor. Since the war, the women have been reluctant to leave their homes and to live in dormitories and the silk industry is migrating to them. The large factories are giving way to small village establishments of 10 to 25 looms, and looms are being installed in the farm houses to be worked by both the men and the women during their spare time. The transition is not a complete reversion to the old domestic system, however, for the looms are run by hydroelectric power and the quality of the product is carefully standardized. The new system is apparently successful, for between 1920 and 1927 there was an increase of 20 per cent in the number of looms in operation.[1]

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[1] Raoul Blanchard, "The Utilization of Water Power in France," *Harvard Business Review*, January, 1928.

Japan is especially well adapted to the decentralization of industry. In no other country does the same opportunity exist for the development of village manufacturing. The surplus population is in the villages and it prefers to remain there. The farmers live in small communities, and the prevailing form of agriculture with its very small holdings creates both the spare time and the necessity for a subsidiary occupation. Japan is a country of short distances, and raw materials and finished products can be moved easily. There is an abundance of water power and there are few sections of the country that are not within easy reach of a potential power site. There has been a remarkable development of water power possibilities, and Japan ranks seventh among the nations of the world in the annual output of electricity.[1] Electricity is available to the smallest village and is in use for light in the remotest farm house. Any system that can utilize the small unit in manufacturing would minimize the disadvantages of the scarcity of capital prevailing in Japan.

But the strongest argument for decentralized manufacturing is the fact pointed out in Chapter XI that much of the Japanese industry is already in the villages and is carried on, for the most part, in relatively small units. This rural industry is a heritage of the domestic manufacturing of the feudal period, but it may also be a forerunner of a new and saner industrial system that is destined to supplement, if not supplant, the ready-made industrial order imported from the Occident. Even the new factory industries are showing some tendency to decentralize, for it is the policy of the large cotton spinning companies to establish new branches not in crowded urban centers but in rural areas within easier reach of a supply of labor.

It must be recognized that all manufacturing cannot go to the village or farm. For the present, at least, the making of iron and steel is tied to coal mines, to deposits of iron ore, and to cheap water transport for both raw materials and finished products. The industry must be carried on in huge plants with access to a large labor supply. The heavy machine industries have similar requirements and will probably continue to be confined to the urban manufacturing centers, especially those in northern Kyushu, in the Osaka district, and in Hokkaido.

Other industries are not so bound to the city. The raw materials for textile manufacturing can move to labor or to power and the cost of transporting the finished product to market is not a vital factor. The textile industries will be scattered throughout the Japanese islands to even a greater extent than they are today, the spinning mills and the filatures, with their greater size and more concentrated labor demand, in the towns, the weaving sheds and finishing plants in the villages, and power looms even in the farm houses where weaving will be a by-occupation of greater importance than it is at present. The use of power looms of the automatic type will make it possible for the housewife to tend five or six looms at the same time that she is carrying on her household duties. There will probably be a similar decentralization of the other lighter industries, all utilizing for the running of their machinery electric power generated either by hydroelectric plants or by central steam plants.

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[1] League of Nations, Economic and Financial Section, International Economic Congress Document, Electrical Industry, p. 85.

To complete such a decentralized system of manufacturing, there must be an organization for coordinating production, for maintaining standards of quality, and for marketing the finished goods. The framework of such an organization already exists in the local trade associations that have been formed in every industry and that are usually united in a national federation functioning in foreign trade. With decentralization, the advantages of large scale organization need not be sacrificed, since it should be possible to work out a technique, somewhat similar to the chain store system, for the supervision and management of the small branches or of the units individually owned, for the purchase of raw materials, and for marketing. In the present rationalization of the pottery industry, an industry of domestic workshops and small establishments, the trend, especially in Nagoya and Gifu Prefectures, seems to be not toward consolidation into large companies but toward the organization of the small units into guilds for the purchase of raw materials and for the sale of the finished pottery.[1]

It should be admitted that there is in Japan little conscious movement toward the decentralization of manufacturing. Few Japanese leaders recognize the extent of decentralization in Japanese industry or appreciate how well adapted it is to Japanese conditions. They still follow the example of the West, and at the present time the government is encouraging mergers and consolidations. In certain industries, silk reeling for example, it is endeavoring to eliminate the small unit in favor of large scale enterprise. It is not surprising that such a tendency should persist. A new industrial system evolves slowly or, if its development is to be hastened by the efforts of the government, experimentation and a great deal of vision and imagination are required. The success of a decentralized system, such as the present paragraphs have outlined, demands a very superior organization. It is the line of least resistance to accept and to follow the familiar and established order. To break new ground is the work of the pioneer, and the way of the pioneer is not easy.

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[1] *Trans-Pacific, op. cit.*, May 22, 1930.

An industrial system based upon decentralization rather than upon concentration would seem to be better suited not only to Japan but to all Oriental countries. There is the same scarcity of capital in both China and India, the two other Asiatic countries in which there has been any beginning of industrialization, and the people are even more agricultural than they are in Japan. They cling to their villages, and even if they are enticed away to the city factory, they return to their homes after a stay of a few months. There is a scarcity of factory labor in China, and in India, after more than a century of contact with western manufacturing, there is no permanent factory class. Despite the great density of the Indian population and the poverty of most of the people, there is an abundance of labor for the factory industries only during periods of severe famine. In the face of such conditions, it does seem to be a futile and mistaken procedure to attempt to make over the Oriental peoples and to alter so completely their manner of living, especially since the need for the concentration of manufacturing has largely disappeared and since the crowding that has always accompanied western industry is admittedly one of its major evils. The manufacturing industries should be taken to the villages and so organized that the labor demands will fit in with the requirements of agriculture and preserve the workers' contact with the soil.

A NEW POLICY TOWARD CHINA

Though the small area and the island situation have given to Japan a racial homogeneity and a political integrity so conspicuously lacking in the larger continental countries of Asia, they are a handicap in some respects. It seems to be a characteristic of island nations that however powerful they may become they must continue to draw their strength, Antaeus-like, from the adjacent mainland. The future of Japan is bound up inextricably with Asia, especially with China. Japanese culture, in the period before western influence, came principally from the continent by way of China and Korea. Many of the early arts and industries were of Chinese origin. With the opening of the modern period, Japan, following ample western precedent, adopted an aggressive policy toward her nearest neighbor. Chinese territory was seized and later, control, both political and commercial, was sought over certain essential resources. Though the imperialistic policy has brought to Japan some advantages, it has engendered in the Chinese people a deep hatred and suspicion of the Japanese and it is becoming more and more evident that it is not compatible with the present dependence upon China as a source of raw materials and as a market for Japanese goods. China, politically weak and no match for Japan in open warfare, has perfected in the boycott an economic weapon of defense that strikes Japan in a most vulnerable spot and is bringing about a drastic change in Japanese policy. Japanese industries must have the Chinese market for the disposal of their products, and trade can be carried on successfully only with friendly and satisfied customers. Japanese relations with China will be marked in the future less by force and more by the cultivation of friendly relations and by peaceful penetration through the investment of Japanese capital.

And so concludes the study of Japanese industrialization. The past has been beset with difficulties; the prospect for the future is none too brilliant. Poorly endowed with natural resources and a late comer in the struggle for markets, Japan possesses two valuable assets for industry, a potential labor supply and proximity to the Asiatic mainland with its large and dense population. Upon the successful utilization of these two resources depends the future of the nation in manufacturing. Friendly relations must be established and maintained with the neighboring countries, and through the use of modern equipment and a perfected organization every possible effort must be made to develop the skill and the efficiency of the Japanese workers.

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INDEX

A

Agriculture, importance, 9, 49, 122, 182, 340
  intensification, 26, 31
  machinery, use of, 33
  reclamation of land, 27
Anshan Iron Works, 294, 299, 308
  capacity, 300
  coal supply, 306
  costs of production, 303, 308
  financial report, 303
  iron ore supply, 294–295, 305, 330
  marketing difficulties, 308
  production, pig iron, 299
Aquatic products, export, 427, 445
Arable land, 6, 22, 26–27, 183
  Korea, 261
Arita, 64
Art industries, 60, 63, 151
Ashikaga, 198, 205

B

Birth control (*see* Population, birth control).
Boycotts (*see* Foreign trade, boycotts).
Brewing industry, 108, 113, 117
Brush industry, 145, 196

C

Capital, invested in industry, 114
  Japanese investments in China, 231
  scarcity of, 78, 206, 242, 362, 484
Caste system, 10, 24, 386
Cement and lime industry, 114
Chemical industry, 109
  raw materials, 274
Chemicals, imports, 424–425
China, 312
  coal, output, 314, 322
    resources, 312–313, 320
  coke, cost of production, 320
  coking coal, scarcity of, 314
  iron and steel, 316
    costs of production, 319
  iron ore, output, 323, 330
    resources, 313, 315–316, 322, 328
  penetration of Japanese capital, 317, 326, 328, 330, 435, 451
  pig iron, 318, 321, 324, 330
  relations with Japan, 450, 467, 488
  steel, 319, 321
Chosen (*see* Korea).
Climate, influences of, 140, 176
  Hokkaido, 37
  iron and steel industry, Manchuria, 304
  Korea, 261
  Sakhalin, 288
  silk industry, 127, 130, 210
  water power, 265
Clothing, export, 427, 445
  industry, 160, 190
Coal, consumption, 280–281
  exports, 281, 427, 446, 464
  Formosa, 284
  Hokkaido, 282
  imports, 281
    Korea, 291
  Karafuto, 284
  Kyushu, 282
  output, China, 314, 322
    efficiency, 286, 375

Coal output, Japan, 225, 271, 281
    Korea, 290
    Manchuria, 298
    restrictions, 282, 307
  principal deposits, 282–284
  reserves, China, 280–281, 312, 313, 320
    Japan, 169, 279, 283
    Korea, 283, 290
    Manchuria, 298, 306
Coke, costs, China, 320
    Japan, 286
    Manchuria, 306
  output, China, 322
Coking coal, scarcity of, China, 314, 320
  Japan, 279, 285
  Korea, 290
  Manchuria, 306, 310
Communications (*see* Transportation and communications).
Contract system, 61, 192, 194–195, 197, 207
  brush industry, 196
  cotton weaving, 197
  cutlery industry, 196
  dyeing, bleaching and printing, 199, 205
  farmer-weaver, 198, 202
  geta industry, 194
  jobber, 199
  lantern industry, 192
  pottery industry, 195
  silk cloth industry, 197
  umbrella industry, 193
Copper, export, 67, 272, 427, 446
  imports, 272
  industry, 67, 271
  output, 271, 272
  principal mines, 272
  reserves, 272
Cotton, raw, cultivation in Japan, 20, 68, 261
    Korea, 261, 423
    Manchuria, 262, 423
  imports, 261, 419, 423, 424, 438
  yields, 261–262
Cotton manufactures, export, 419, 427, 432, 442, 476
    Asia market, 433–434, 443, 476
    China market, 434, 464
    Indian market, 437, 477
    tissues, 221, 433, 440, 443, 464, 476
    yarns, 94, 432, 438, 464
  import, 94, 424, 436–438
Cotton manufacturing, 483
  China, 435–436, 460, 467
  India, efficiency, 438
  spinning, 113, 116, 140, 218, 232
    curtailment of output, 219, 237, 366
    efficiency, 367–371, 376, 379
    history, 58, 92
    location of, 140–142, 148, 160
    wage costs, 368–369
  weaving, 113, 117, 187, 221
    efficiency, 371–375, 379
    history, 60, 68, 95
    Hyogo, 150
    Nagoya, 163
    organization of industry, 197
    Osaka, 140
    Shizuoka, 178
    Tokyo, 160
    wage costs, 372–373
Cotton spindles, China, 435, 441
  India, 220, 441
  Japan, 93, 141, 218
    increase, 221, 366, 441
    location of, 132, 142, 340
    number per worker, 369
Cutlery industry, 66, 144, 189

D

Domestic industries (*see* Household industries).
Dyeing, bleaching and finishing, 113, 199
  Kyoto, 154, 186
  Osaka, 141

Dyestuffs, 109
  imports, 426

E

Electrical equipment industry, 113, 118, 158
Electricity, use in lighting, 267
Emigration (*see* Population, emigration).

F

Factory administration, 78, 245, 254
Famines, 8
Fertilizer, imports, 424, 425
Flax, 263
Food, imports, 19, 422, 424
Food supply (*see* Population, food supply).
Foreign experts, 90, 104, 107, 145
  brewing industry, 108
  dyestuffs industry, 109
  iron and steel industry, 172
  mining, 104
  paper making, 109
  rubber industry, 108
  silk reeling, 100
Foreign trade, 419, 423, 448
    (*See also* specific commodities.)
  boycotts, 452
    effects of, 458, 463–464, 468, 471
    of 1908, 453
    of 1909, 454
    of 1915, 454
    of 1919, 455, 458
    of 1921, 461
    of 1923, 461
    of 1927, 465
    of 1928–1929, 466
  exports, 423, 427–428, 445, 448, 450
    to Africa, 443, 478
    to Asia, 433–434, 443, 448–449, 474
Foreign trade, exports, to Australasia, 429, 444, 478
    to Canada, 429, 444, 478
    to China market, 433–434, 449, 463–464, 469
    to Dutch East Indies, 433, 443, 475–476
    to Great Britain, 428
    to India, 433, 437, 443, 475–476, 478
    to Kwantung, 470
    to Malaya, 433, 443, 475–476
    to Philippines, 443, 475–476
    semi-manufactures, 423, 426
    to South America, 444, 478
    to United States, 428–430, 448–449
  importance of, 70, 76
  imports, 422, 424, 437
    from Asia, 437
    from Great Britain, 436–437
    raw materials, 422, 423
    from United States, 437
  measure of industrialization, 229
  reputation of goods, 150, 227, 446
  trade balance, 419, 421, 422
Formosa, colonization, 39
Fukushima, 120
Fushun colliery, coking quality of coal, 306
  control of, 293, 306
  history, 306
  output, 298, 306
  reserves, 306

G

Geta industry, 194
Gifu, 120, 167, 192
Glass industry, 145, 161
Gold, 273
Government control of industry, electric power, 268
  Imperial Steel Works, 106, 172, 222, 234, 238
  railways, 81

Government control of telegraph, 83
  telephone, 83
  water power, 265
Government encouragement of industry, 77, 89
  communications, 79
  cotton spinning, 92
  dyestuffs industry, 109
  iron and steel, 104, 169, 222, 233, 239
    Manchuria, 300
  merchant marine, 86
  mining, 104
  shipbuilding, 85, 148
  silk reeling, 100, 236
Gumma, 120

H

Hanyang Iron Works (*see* Hanyehp'ing Iron and Coal Company).
Hanyehp'ing Iron and Coal Company, 316, 326
  Hanyang Iron Works, capacity, 319
    cost of production, 319
    history, 317, 319
    pig iron production, 321
    steel production, 321
  loans from Japan, 317, 318, 324, 325, 326
  P'inghsiang colliery, 320
    coke ovens, 318, 320
    output, 322
    reserves, 320
  relations with Japan, 317, 320, 324, 326
  Tayeh blast furnaces, 324
  Tayeh iron mine, 318, 322
    output, 323, 330
    reserves, 322
Hardware industry, 114, 144, 159
Hemp, 263
Hokkaido, agriculture, 30
  coal, 282, 284
Hokkaido, colonization, 36
  flax, 263
  iron industry, 181, 277
  iron ore, 277
  lumber, 264
  petroleum, 288
  principal industries, 180
  sulphur, 274
Hours (*see* Labor, hours).
Household industries, historical background, 49, 78, 145, 149, 154, 165, 168
  location of, 61
  principal, 49, 61, 145, 192
    (*See also* Manufacturing industries, principal.)
    art, 63, 151
    brush, 145, 196
    copper, 67
    dyeing and bleaching, 153, 199
    geta, 194
    lantern, 168, 192
    match, 108, 149
    pottery, 63, 164, 195
    rubber, 108, 150
    silk, 98, 103, 128, 211
    tea, 107, 176
    umbrella, 168, 192
    weaving, 67, 95, 153, 197
  processes (*see* Industrial processes).
  size of establishments (*see* Manufacturing industries).
  use of wood, 54, 143, 202, 203
Hydroelectric power (*see* Power).

I

Imperial Steel Works (*see* Iron and steel industry).
Industrial processes, 49, 57, 91, 96
  brush industry, 196
  cocoon raising, 211
  cotton cloth industry, 197
  cotton spinning, 58
  cutlery industry, 197
  geta industry, 194

Industrial processes, hardware industry, 254
  iron and steel industry, 57
  lantern industry, 192
  rubber industry, 254
  silk reeling, 100, 253
  tea industry, 107
  umbrella industry, 193
Industrial Revolution, 73, 89, 222, 483
Interest rates, 243
Iron and steel industry, capacity, China, 319, 324
    Japan, 223–224, 233
    Korea, 290
    Manchuria, 298, 300
  ferro-alloys, 276, 334
  feudal, 57, 64, 105, 278
  government encouragement, 104, 169, 222, 233, 239, 302
  Hokkaido, 181, 277
  Imperial Steel Works, 222, 233, 238
    capacity, 172
    construction, 106, 169, 172
    production, 235, 239
    profits, 222
    raw materials, 173, 286, 289, 326, 333
  imports, 424, 425
  iron ore (*see* Iron ore).
  iron sands, 278
    concentration, 278
  Kyushu, 169, 172
  location of, 65, 169, 173, 179
  modern, 172, 221, 233, 238
    weakness of, 221, 482
  Osaka, 143
  output control, 238
  pig iron (*see* Pig iron)
  profits, 222, 233, 234, 240
  scrap iron, use of, 278
  Sendai, 277
  steel (*see* Steel).
  subsidies, 222, 239, 301
Iron ore, Australasia, 334
  concentration, Japan, 278
Iron ore, concentration, Manchuria, 296
  imports, 419, 424
    from China, 319, 327–329
    from Korea, 289
    from Malay Peninsula, 333
  India, 336
  Korea, 289
  Malay States, 332
  output, China, 323, 330
    Japan, 277–278
    Manchuria, 305, 330
  Philippine Islands, 336
  principal deposits, China, 315, 322, 328
    Japan, 277
    Korea, 289
    Manchuria, 295
  requirements of Japan, 279, 317, 319
  resources, China, 313, 315, 316, 322, 328
    India, 336
    Japan, 105, 179, 277, 279
    Korea, 289
    Manchuria, 295, 299

J

Japan, comparison with England, 2, 71, 96, 266, 484
  defense, 73, 222, 231, 294, 481
  expansion of Empire, 35, 76, 289, 292, 312
  sovereignty, 75
Johore, iron ore, 332
Jute, 263

K

Kaolin, 63, 165, 274
Karafuto, coal, 284
  colonization, 38
  lumber, 264
Kiryu, 201, 205
Kobe, 135
  advantages for manufacturing, 147

Kobe, harbor, 147, 155
  principal industries, 148
Korea, 292, 295
  coal, 290
  colonization, 39
  cotton, raw, 261, 423
  iron industry, 289
  iron ore, 289
  Japanese control, 292
  petroleum, 288
  pig iron production, 290
  Showa Steel Manufacturing Company, 300
Kwantung Leased Territory (*see* Manchuria and Liaotung Peninsula).
Kyoto, advantages for manufacturing, 64, 69, 151
  principal industries, 68, 151
    dyeing and printing of cloth, 186
    pottery, 64, 189
    silk weaving, 186
Kyushu, advantages for manufacturing, 169
  coal, 282, 285
  principal industries, 171

L

Labor, bonuses, 348
  cheapness of, 346, 362
  cost of living, 353
  costs, 351, 354, 361, 380
    discharge allowances, 358
    dormitory system, 354
    recruiting, 342
    reserve force, 362
    wages, 362, 368–369, 372-373
  discharge allowances, 358
  disputes, 416
  dormitory system, 340, 354, 355
    food, 357
    prevalence of, 352
    restrictions, 343
  double shift, 364, 377, 440
  efficiency, 255, 257, 362, 375
Labor, efficiency, coal mines, 286, 375
    cotton spinning, 367–371, 376, 379, 438
    cotton weaving, 371–375, 379, 439
    improved machinery, effect of, 379
    long hours, effect of, 363, 376
    low wages, effect of, 362
    night work, effect of, 365
    railways, 375
    silk reeling, 257, 375, 377–378
    tea industry, 380
  factory workers, 113, 209, 389
    in dormitories, 342
    increase, 183, 232
    scarcity, 340
  female, 342, 345, 389
  hours, 363, 364, 404, 410
    cotton spinning, 364, 404
    household industries, 203, 363
    silk reeling, 363, 404
    Washington Hours Conference, 363, 365, 386, 404
    women and children, 363, 365, 404, 408
  household industries, 78, 192, 347, 389
    cocoon raising, 128, 211, 348
  international standards, effect of, 382, 386
  male, 389
  night work for women and children, 364, 365, 404, 408
  paternalism, 360, 390
  recruiting, 340
  supply, 339
  turnover, 344
  unemployment, 345, 409
  wages, 348, 412
    and cost of living, 353, 412
    cotton spinning, 368–369, 413, 415
    cotton weaving, 372–373
    female, 349, 350

- Labor, wages, household industries, 203, 212, 213
    - male, 349, 350
    - railway, 414, 415
    - silk reeling, 414, 415
    - trends, 412, 415
  - working population, 389
- Labor legislation, 403, 406–407
  - child labor, 408
  - conciliation and arbitration, 409
  - Factory Act of 1911, 403
    - of 1923, 358, 404
  - hours, 363, 404, 410
  - insurance and compensation, 408
  - manhood suffrage, 409
  - minimum age for industrial employment, 403, 405, 408
  - night work for women and children, 364, 404, 408
  - trade union bill, 408
  - underground work for women, 409
  - unemployment, 409
  - for women and children, 363, 404, 408
- Labor movement, 382
  - Council of Japanese Labor Unions, 393, 395
  - "dangerous thought," 390
  - foreign influence, 383, 387
  - General Federation of Japanese Labor, 385, 393, 395
  - General Federation of Japanese Labor and Farmers, 393, 396
  - government suppression, 383, 386, 390
  - historical background, 383
  - important unions, 393, 394
  - internal dissension, 393
  - Japan Seamen's Union, 396
  - membership, 387, 388, 394
    - increase, 398
  - obstacles to, 388
  - political parties, 398, 401
    - internal dissension, 399
- Labor movement, political parties, manhood suffrage, 398, 409
    - program, 401
    - proletarian vote, 401
  - programs, 385, 406–407, 411
  - Public Peace Police Regulation of 1900, 384, 410
  - Yuai Kai, 384
- Lantern industry, 168, 192
- Liaotung Peninsula, 292, 311
- Lumber, imports, 264, 424, 426
  - industry, 114, 179
  - resources, 264

M

- Machinery, foreign, use of, 91, 108, 245, 249
    - iron and steel industry, 105, 172
    - rubber industry, 254
    - silk reeling, 100, 253
  - imports, 424
  - industry, 114, 144
  - Japanese inventions, 252
  - old equipment, use of, 245, 379
- Manchuria, 292, 295, 310
  - Chinese migrations, 41
  - coal, coking, 298, 306
    - Japanese control, 293, 309, 310
    - output, 298
    - reserves, 298, 306, 309
  - cotton, raw, 262, 433
  - iron industry, capacity, 298, 300
    - concentration of ores, 296, 305
    - history, 297
    - iron ore, 295, 297, 299, 305, 309
    - Japanese control, 297, 309
    - pig iron production, 299
  - Japanese capital, 292, 297, 300
  - Japanese control in, 292, 311, 461
  - Japanese migrations, 40, 295
  - Korean migrations, 39, 40
  - lumber, 264

Manchuria, oil shale, 309
  source of food for Japan, 294
  steel industry, 300
Manufacturing industries (*see also* specific industries).
  decentralization, 483, 485
  feudal period, 49, 61, 78
  locating factors, 132, 284
    cutlery industry, 144
    dyeing and bleaching, 154
    electrical equipment industry, 158
    iron and steel industry, 143, 169, 173
    Korea, 301
    Manchuria, 300
    pottery industry, 164
    shipbuilding, 148, 174
    silk industry, 120, 161
    tea industry, 176
  location of, 61, 120–121, 132–133, 142
  minor centers, 167, 175, 179, 180
  principal, 49, 61, 90, 113, 209, 483
      (*See also* Household industries, principal.)
    brewing industry, 108, 171, 180
    cotton spinning, 92, 140, 148, 159, 164, 218, 235
    dyeing and bleaching, 141, 198
    electrical equipment industry, 158, 171
    hardware industry, 144, 159. 171
    iron and steel industry, 64, 104, 143, 172, 181, 221, 233, 238
    lumbering, 179, 180
    paper and pulp industry, 179, 180
    printing and bookbinding, 143, 158
    shipbuilding, 144, 148, 161, 174
Manufacturing industries, principal, silk reeling, 96, 120, 163, 209
    weaving, 67, 95, 141, 159, 163, 178, 214, 221
    woolen industry, 150, 159
  principal centers, 61, 120, 132
    Kobe, 146
    Kyoto, 68, 151
    Kyushu, 168
    Nagoya, 161
    Osaka, 132
    raw silk area, 120
    Tokyo-Yokohama, 155
  size of establishments, 60, 118, 185, 192
    clothing industry, 190
    cotton spinning, 185, 190
    cutlery industry, 189
    feudal industries, 60, 192
    iron and steel industry, 172, 185
    Kyoto, 152, 186
    Kyushu, 171
    match industry, 150
    Nagoya, 187
    Osaka, 157, 161, 190
    pottery industry, 152, 165, 187
    rubber industry, 108, 150, 190
    silk industry, 213
    tea industry, 107, 177
    Tokyo, 157, 161, 190
    weaving industry, 150, 186
  value of product, 113, 183, 209
Match exports, 149, 427, 446, 460
Match industry, 108, 149
Mechanical skill, 79, 101, 242, 248
Merchant marine, 84, 86
Metal industry, 113, 158, 171
Miao-Erh-Kou, iron ore, 295, 305, 330
Mining, 104, 273
Mulberry, 21, 68, 126

N

Nagano, silk industry, 20, 120
Nagasaki, 174

Nagoya, advantages for manufacturing, 161
  principal industries, 64, 163

O

Oil shale, Manchuria, 309
Okaya, 124
Osaka, 135
  advantages for manufacturing, 137
  harbor, 137
  population, 135
  principal industries, 66, 140

P

Paper, exports, 427, 446
Paper and pulp industry, 113, 118, 180
  history, 109
  Hokkaido, 180
  Shizuoka, 179
Penhsihu, coal mine, 298
  iron works, 297
Petroleum, Borneo, 289
  consumption, 287
  imports, 287, 424, 426
  output, 287
  reserves, 287
  Sakhalin, 288
Pig iron, imports, 224, 419, 424
    from China, 319, 327, 329
    from Korea, 290
    from Manchuria, 308, 329
  India, 336
  Korea, 290
  production, China, 321
    Japan, 105, 172, 222–224, 234
    Korea, 290
    Manchuria, 299
P'inghsiang colliery (*see* Hanyehp'ing Iron and Coal Company).
Population, birth control, 46
  birth rate, 11, 16, 25
Population, colonization, 35
    Formosa, 39
    Hokkaido, 36
    Karafuto, 38
    Korea, 39
  death rate, 6, 8, 14
    prevalence of intestinal diseases, 15
  density, 5, 183, 339
  effects of feudal restrictions, 9, 12
  emigration, 35, 43, 46
    Brazil, 44
    Manchuria, 40
    United States, 44
  famines, 8
  food supply, 5, 17, 22, 30
    changes in diet, 34
    effects of agricultural specialization, 20
    imports, 19, 422
  increase, 4, 14, 23, 30
    propaganda of large family, 17
    Tokugawa period, 6
  occupation, 184, 389
  rural, 122
  urban, 25, 122, 132, 133
Pottery, export, 427, 445
  industry, Arita, 174
    Kyoto, 152
    location of, 63
    Nagoya, 164, 187, 195
    raw materials, 64, 165, 274
    Seto, 64, 165, 188
Power, consumption, 114, 226, 267
  electric, 267
    control of, 267
    resources, 268, 269
    use, in agriculture, 158, 267, 269–270
      in industry, 158, 203, 267
  hand, 13, 53
    silk reeling, 102
    weaving industry, 96, 153, 203
  hydroelectric, control of, 265, 267

Power, hydroelectric, history of, 267
    location of, 265, 267
    resources, 266, 268–269
    use in industry, 131, 158, 226
  Osaka, 267–268
  steam, 101, 227, 268–270
    location of, 268
  Tokyo, 267–268
  water (*see also* Power, hydroelectric).
    silk reeling, 102, 131
    use in industry, 93, 201, 203
Printing and bookbinding, 113, 118
  Osaka, 143
  Tokyo, 158

R

Railways, construction, 79, 81
  electrification, 267
  financing, 80, 82
  government control, 81
  Manchuria, 293
  mileage, 83
  nationalization, 81
Rainfall, 127, 130, 265
Ramie, 263
Rationalization, 259, 379, 416
Raw materials, 260, 275, 276, 337 (*See also* Coal, Iron ore, etc.).
Rice, consumption, 6, 18
  production, 23, 30
Rivers, important, 265
Rubber industry, 108, 150, 190

S

Saitama, 120
Sakai, 66, 67, 144, 189
Sakhalin (*see also* Karafuto).
  petroleum, 288
Salt, 275
Sand, glass, 274
Sano, 198, 205, 228
Seto, 64, 165, 188
Shantung, controversy, 275, 455, 461
  iron ore, 329
Shipbuilding, 84, 113, 117
  Kobe, 148
  Kyushu, 174
  Osaka, 144
  Tokyo-Yokohama center, 159
Shizuoka, principal industries, 107, 176
  tea, 22, 107, 176
Showa Steel Manufacturing Company, 300
Silk, cocoons, 123, 125, 211
    organization of production, 128, 211
  raw, 260
    competition of rayon, 430
    export, 209, 419, 426–432
    price control, 236
    producing centers, 68, 121
    production, 103, 210, 232
    threat of Chinese industry, 431
  reeling, 96, 113, 116, 209
    curtailment of output, 236
    efficiency, 257, 375, 377–378
    Nagano, 20, 120
    Nagoya, 163
    Suwa district, 129
    Tomioka filature, 100
  tissue, export, 214, 419, 426–429
  weaving, 113, 117, 153
    curtailment of output, 237
    Fukui, 179
    Kyoto, 186
    location of industry, 68
    minor importance of, 214, 260
Silkworm, 127
  export of eggs, 98
Silver, 273
South Manchuria Railway, 293, 300, 309
  (*See also* Anshan Iron Works, Fushun colliery, Yentai colliery.)
Standard of living, 17–19

Steel, China, 320–321
  Japan, 106, 172, 222, 224
  Korea, 290, 300
  Manchuria, 300
Subsidies, 90, 92
  cotton cultivation, 261
  dyestuffs industry, 110
  iron and steel industry, 222, 239, 301
    concentrating plant, 278
  merchant marine, 88
Sugar, exports, 427, 446, 464–465
  industry, 113
Sulphur, 273
Suwa district, 124, 129

T

T'aoch'ung, iron mine, 330
Tariff autonomy, China, 474
  Japan, 89
Tatsu Maru episode, 453
Tayeh blast furnaces (*see* Hanyehp'ing Iron and Coal Company).
Tayeh iron mine (*see* Hanyehp'ing Iron and Coal Company).
Tea, export, 427, 445
  industry, 107, 176
Telegraph, 83, 84
Telephone, 83, 84
Tokyo, advantages for manufacturing, 155, 158
  principal industries, 66, 157
Topography, influences of, 26, 134, 167, 179
  Kobe, 147
  Korea, 261
  Kyushu, 170
  Nagoya, 161
  Osaka, 138, 267
  silk industry, 125, 130
  tea industry, 176
  Tokyo, 155, 267
  water power, 265
Trade associations, 228
Transportation and communications (*see also* Railways, Merchant marine, Telegraph, Telephone).
  feudal period, 9, 79, 83, 86
  importance to industry, 101, 123, 132, 167
    Kyushu, 170
    Nagoya, 161
    Osaka, 137
    Tokyo, 156
Tsinan incident, 466
Tsingtao incident, 465
Twenty-one Demands, 294, 319, 454

U

Umbrella industry, 168, 192

W

Wages (*see* Labor, wages).
Wakayama, 135, 154
Water power (*see* Power).
Westernization of industry, 77, 90, 110, 253
  brewing industry, 108
  chemical industry, 109
  cotton spinning, 92
  cotton weaving, 95
  cutlery industry, 144
  iron and steel industry, 104, 172
  Kyushu, 168
  match industry, 108
  merchant marine, 86
  mining, 104
  Osaka, 135
  paper industry, 109
  rubber industry, 108
  shipbuilding, 85
  silk reeling, 100
  tea industry, 107
  transportation and communications, 79
Wood, use of, 54, 143, 202, 203, 264

Wool, raw, 263, 425
  imports, 263, 419, 424
Woolen cloth industry, 113
  Kobe, 150
  Osaka, 141
  Tokyo, 160
Woolen manufactures, imports, 423, 424
World War, effects on industrialization, 231
    postwar depression, 235

Y

Yamagata, 120
Yamanashi, 120
Yawata, 169, 222
  (*See also* Iron and steel industry, Imperial Steel Works.)
Yellow Industrial Peril, 481
Yentai colliery, 293, 309
  output, 298, 309
Yokohama, 134, 155

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